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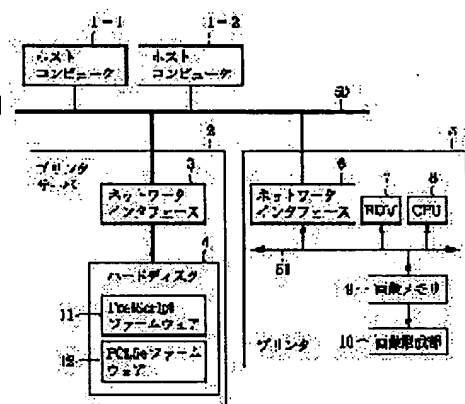
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(54) SYSTEM FOR CONTROLLING PRINTING AND METHOD FOR CONTROLLING PRINTING FOR THE SAME AND STORAGE MEDIUM FOR STORING PROGRAM READABLE BY COMPUTER

(57)Abstract:

PROBLEM TO BE SOLVED: To minimize the load of a memory to be ensured at a printing controller side even when the change of analyzing resources for analyzing various printing information or the kind of the analyzing resources is increased.

SOLUTION: A CPU at a printer server side judges the kind of printing information preserved in a hard disk 4, and a transferring means selects optimal firm ware 11 and 12 for analyzing the printing information based on the judged result from the hard disk 4, and transfers it with the preserved printing information to a printer controller 5. A CPU 8 of the printer controller 5 analyzes the printing information based on the firm ware transferred with the printing information from the printer server 2, and generates picture data which can be outputted from a picture forming part 10.



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CLAIMS

[Claim(s)]

[Claim 1] The server equipment which manages the printed information from two or more host computers through predetermined communication media, A preservation means to be the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and to save the printed information from each host computer, A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs, A judgment means to judge the class of said printed information saved for said preservation means, The server equipment which has a transfer means to transmit to said printer control device with said printed information which chose the optimal analysis resource for analyzing said printed information based on the judgment result of said judgment means from said storage means, and was saved for said preservation means, The printing control system characterized by having the print control unit which has an image-processing means to analyze said printed information based on the analysis resource transmitted with said printed information from said server equipment, and to generate the image data in which an output is possible from said image formation section.

[Claim 2] The server equipment which manages the printed information from two or more host computers through predetermined communication media, A preservation means to be the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and to save the printed information from each host computer, A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs, The judgment means which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information saved for said preservation means, With said printed information which chose the optimal analysis resource for analyzing said printed information based on the collating judging result of said judgment means from said storage means, and was saved for said preservation means Or the server equipment which has a transfer means to transmit said printed information saved for said preservation means to said printer control device, The printing control system characterized by having the print control unit which has an image-processing means to analyze said printed information based on the analysis resource transmitted with said printed information from said server equipment, and to generate the image data in which an output is possible from said image formation section.

[Claim 3] Said judgment means is a printing control system according to claim 1 or 2 characterized by judging the class of Page Description Language of said printed information.

[Claim 4] Said judgment means is a printing control system according to claim 1 or 2 characterized by judging the class of data compression method of said printed information.

[Claim 5] The server equipment which manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which judges the class of printed information from each host computer, The transfer process which chooses the optimal analysis resource for analyzing

said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information, The printing control approach of the printing control-system printing control system characterized by having the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information.

[Claim 6] The server equipment which manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which judges the class of printed information from each host computer, The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information, The storage characterized by storing the program including the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information which a computer can read.

[Claim 7] The server equipment which manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer, The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit, The printing control approach of the printing control-system printing control system characterized by having the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information.

[Claim 8] The server equipment which manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer, The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit, The storage characterized by storing the program including the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information which a computer can read.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the storage which stored the program which the printing control approach and computer of the printing control system with which the server equipment which manages the printed information from two or more host computers through predetermined communication media, and the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and a printing control system can read.

[0002]

[Description of the Prior Art] The network printer is general as a printer which prints the document conventionally drawn up using the computer etc. and which is shared by two or more users.

[0003] This is the gestalt of connecting one or more sets of the printer server which holds a print job temporarily, and printers with two or more host computers which each user uses by the network, and transmitting and printing print data on a printer via a printer server.

[0004] Moreover, recently, it is Adobe Systems with one printer. Shrine "PostScript" language and Hewlett Packard Two Page Description Languages of shrine "PCL5e" language are processed, the printer which can generate image data is common, and the printer which judges which data of these two Page Description Languages it is, and is processed from the contents of the received data is general.

[0005] Drawing 7 is a block diagram explaining this kind of printer structure of a system.

[0006] In drawing 7, 1-1 and 1-2 are host computers, and are constituted possible [a communication link of the printer server 2 and a printer 5] through the network 50.

[0007] In the printer server 2, 3 is a network interface and performs the communication link with a network 50. 4 is a hard disk and spools a host computer 1-1 and the printing demand from 1-2.

[0008] In a printer 5, 6 is a network interface and performs the communication link with a network 50. 7 is ROM and has memorized various kinds of control programs which CPU8 should perform, data, font data, etc. 9 is an image memory and carries out the specified quantity storage of the image data which CPU8 drew based on the printed information which received through the network interface 6 and which can be printed. 10 is the image formation section (printer engine), and prints to a record medium based on the image data memorized in the image memory 9.

[0009] In addition, the firmware for a judgment which judges the class of received data on ROM7, the firmware which processes the data of PostScript language and generates image data, and the firmware which processes the data of PCL5e language and generates image data are saved. Hereafter, the case where it prints by the printer 5 from a host computer 1-1 is explained.

[0010] Drawing 8 is a flow chart which shows an example of the data-processing procedure of the printer server 2 shown in drawing 7. In addition, (1) - (3) shows each step. Moreover, if the user of a host computer 1-1 directs a print in a host computer 1-1, the data for a print will be generated by the printer driver which generates the data for transmitting to a printer 5. In addition, the data for a print generated change with printer drivers to be used. It sets to this example and is Adobe Systems. The PostScript language of a shrine, and Hewlett Packard The case where PCL5e of a shrine is used is described.

[0011] First, the data generated by the printer driver are transmitted to the printer server 2 via a network 50, and the document data sent through a network 50 are received by network interface 3 course at the printer server 2 (1). Subsequently, in the printer server 2, the received data are once saved at a hard disk 4 (2).

[0012] Then, the data saved at the hard disk 4 are sent to a printer 5 by network interface 3 and network 50 course, and end (3) and processing.

[0013] Drawing 9 is a flow chart which shows an example of the data-processing procedure of the printer 5 shown in drawing 7. In addition, (1) – (7) shows each step.

[0014] The data transmitted from the printer server 2 by the printer 5 are received. First, (1), The received data are analyzed. In the data of (2) and PostScript language When it judges whether it is data of PCL5e language and is judged with (3) and the received data being data of PostScript language The firmware which processes the data of PostScript language is started, data are processed, image data is generated on an image memory 9, and it progresses after (4) and a step (7).

[0015] On the other hand, when it judges whether it is data of PCL5e language when judged with NO and is judged with it being the language of (5) and PCL5e at a step (3), the firmware which processes the data of PCL5e language is started, data are processed, and image data is generated on an image memory 9 (6). Subsequently, an image is formed on a form by the image formation section 10 based on the image data generated on the image memory 9, and (10) and processing are ended.

[0016] On the other hand, when judged with it not being the language of PCL5e at a step (5), it prints at a step (7) as what received image data, and processing is ended.

[0017] Thus, after saving temporarily a host computer 1-1 and the data of the Page Description Language generated by 1-2 at a printer server, it is possible to transmit to a printer 5, to process with the firmware for Page Description Language processing, to generate image data, and to form an image.

[0018]

[Problem(s) to be Solved by the Invention] However, since the program of a printer of operation is memorized by ROM8 in a printer, in order to update the program for actuation, exchange of ROM8 is needed. As for the renewal of the program for actuation of further two or more printers, ROM exchange of each printer is needed.

[0019] Moreover, in the case of the printer which supports two or more Page Description Languages, since it is necessary to memorize the program of operation for each Page Description Languages to ROM of a printer, mass ROM is needed.

[0020] Furthermore, since the received document data need to judge [in / for of which Page Description Language it is document data / a printer] in the case of the printer which supports two or more Page Description Languages, it is necessary to include the function of a Page Description Language judging in the program for actuation of a printer.

[0021] Moreover, since the free areas of ROM for memorizing the program of operation run short when supporting a new Page Description Language, it is necessary to redesign the circuit which can mount mass ROM.

[0022] Furthermore, when it was the system to which two or more printers are connected, since ROM was needed for all printers and many ROMs were needed as the whole system, there were troubles, such as becoming a cost rise.

[0023] The purpose of the 1st invention which was made in order that this invention might cancel the above-mentioned trouble, and relates to this invention – the 8th invention By acquiring the analysis resource for analyzing various printed information from server equipment, and making recombination of it possible with printed information Modification of the analysis resource for analyzing various printed information, Even if the class of analysis resource increases, it is offering the storage which stored the program which the printing control approach and computer of the printing control system which can make the minimum the memory burden which a print control unit side's should be secured, and a printing control system can read.

[0024]

[Means for Solving the Problem] The server equipment with which the 1st invention concerning this invention manages the printed information from two or more host computers through

predetermined communication media, A preservation means to be the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and to save the printed information from each host computer, A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs, A judgment means to judge the class of said printed information saved for said preservation means, The server equipment which has a transfer means to transmit to said printer control device with said printed information which chose the optimal analysis resource for analyzing said printed information based on the judgment result of said judgment means from said storage means, and was saved for said preservation means, It has the print control unit which has an image-processing means to analyze said printed information based on the analysis resource transmitted with said printed information from said server equipment, and to generate the image data in which an output is possible from said image formation section.

[0025] The server equipment with which the 2nd invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, A preservation means to be the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and to save the printed information from each host computer, A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs, The judgment means which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information saved for said preservation means, With said printed information which chose the optimal analysis resource for analyzing said printed information based on the collating judging result of said judgment means from said storage means, and was saved for said preservation means Or the server equipment which has a transfer means to transmit said printed information saved for said preservation means to said printer control device, It has the print control unit which has an image-processing means to analyze said printed information based on the analysis resource transmitted with said printed information from said server equipment, and to generate the image data in which an output is possible from said image formation section.

[0026] As for said judgment means, the 3rd invention concerning this invention judges the class of Page Description Language of said printed information.

[0027] As for said judgment means, the 4th invention concerning this invention judges the class of data compression method of said printed information.

[0028] The server equipment with which the 5th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which judges the class of printed information from each host computer, The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information, It has the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information.

[0029] The server equipment with which the 6th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which judges the class of printed information from each host computer, The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information, The program including the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates

the image data in which an output is possible from said image formation section with said printed information which a computer can read is stored in a storage.

[0030] The server equipment with which the 7th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer, The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or it has the transfer process which transmits said printed information to said printer control unit, and the image-processing process which analyzes said printed information based on the analysis resource transmitted with said printed information, and generates the image data in which an output is possible from said image formation section.

[0031] The server equipment with which the 8th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer, The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit, The program including the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information which a computer can read is stored in a storage.

[0032]

[Embodiment of the Invention]

The [1st operation gestalt] Drawing 1 is a block diagram explaining the printing structure of a system which shows the 1st operation gestalt of this invention, and has given the same sign to the same thing as drawing 7.

[0033] In drawing 1, 1-1 and 1-2 draw up the document to print, and it is a printer server, and the host computer which generates the data for a print, and 2 hold the firmware for actuation of a host computer 1-1, the data transmitted from 1-2, and a printer, and transmit to a printer 5. 3 is a network interface and controls a transfer of the data through a network 50, and firmware. 4 is a hard disk and holds data and firmware. 5 is a printer, it arranges data with firmware, generates an image, and performs image formation on a form.

[0034] 6 is a network interface and controls a transfer of the data through a network 50, and firmware. 7 is ROM and holds the program which controls a transfer of data and firmware.

[0035] 8 is CPU and performs firmware of a printer 5 based on the control program memorized by ROM7. 9 is an image memory and holds image data. 10 is the image formation section and forms an image on a form based on the image data formed on the image memory 9. 50 is a network for combining computers and printers, such as Ethernet. 51 is a hard disk interface and 52 is a CPU bus.

[0036] In addition, the PostScript firmware 11 for the printers for processing data in a printer 5 to a hard disk 4, and generating image data (the 1st firmware) and the firmware 12 for PCL5e (the 1st firmware) shall be saved.

[0037] Hereafter, correspondence and its operation with this operation gestalt and each means of the 1st - the 4th invention are explained with reference to drawing 1 etc.

[0038] The server equipment (printer server 2) with which the 1st invention manages two or more host computers 1-1 and the printed information from 1-2 through predetermined communication media (network 50), It is the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. A preservation means to save the printed

information from each host computer (hard disk 4), A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs (hard disk 4), A judgment means to judge the class of said printed information saved for said preservation means (CPU which the printer server 2 does not illustrate), With said printed information which chose the optimal analysis resource for analyzing said printed information based on the judgment result of said judgment means from said storage means, and was saved for said preservation means The server equipment which has a transfer means (CPU which the printer server 2 does not illustrate) to transmit to said printer control device, Based on the analysis resource transmitted with said printed information, said printed information is analyzed from said server equipment. It has the print control unit which has an image-processing means (CPU8 performs and processes the control program memorized by ROM7) to generate the image data in which an output is possible from said image formation section. The class of said printed information by which CPU by the side of server equipment was saved at the hard disk 4 is judged. The optimal firmwares 11 and 12 for a transfer means to analyze said printed information based on this judgment result are transmitted to said printer control unit with the printed information saved by choosing from a hard disk 4. Since CPU8 analyzes said printed information and generates the image data in which an output is possible from said image formation section 10 based on the firmware transmitted with said printed information from the printer server 2 by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0039] The server equipment with which the 2nd invention manages two or more host computers 1-1 and the printed information from 1-2 through predetermined communication media (network 50), It is the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section 10 can communicate. A preservation means to save the printed information from each host computer (hard disk 4), A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs (hard disk 4), The judgment means which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information saved for said preservation means (CPU which the printer server 2 does not illustrate), With said printed information which chose the optimal analysis resource for analyzing said printed information based on the collating judging result of said judgment means from said storage means, and was saved for said preservation means Or the server equipment which has a transfer means (CPU which the printer server 2 does not illustrate) to transmit said printed information saved for said preservation means to said printer control device, Based on the analysis resource transmitted with said printed information, said printed information is analyzed from said server equipment. It has the print control unit which has an image-processing means (CPU8 performs and processes the control program memorized by ROM7) to generate the image data in which an output is possible from said image formation section. The collating judging of the class of analysis resource with which CPU which the printer server 2 does not illustrate is acquired from the class and said print control unit of said printed information saved at the hard disk 4 is carried out. With said printed information saved by choosing from a hard disk 4, the optimal analysis resource for analyzing printed information based on this judgment result Or said printed information saved at the hard disk 4 is transmitted to said printer control unit. Since CPU8 analyzes said printed information and generates the image data in which an output is possible from said image formation section based on the analysis resource transmitted with said printed information from said server equipment by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which

should be secured to a print control unit side Since only printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0040] Since said judgment means catches and judges the class of Page Description Language of said printed information, the 3rd invention can specify the optimal analysis resource which should analyze the printed information based on various Page Description Languages.

[0041] Since said judgment means judges the class of data compression method of said printed information, the 4th invention can specify the optimal analysis resource which should analyze the printed information based on various data compression methods.

[0042] Drawing 2 is a flow chart which shows an example of the 1st data-processing procedure of the printing system concerning this invention, and corresponds to the processing of the printer server 2 shown in drawing 1 . In addition, (1) - (7) shows each step.

[0043] In addition, if the user of a host computer 1-1 directs a print in a host computer 1-1, the data for a print will be generated by the printer driver which generates the data for transmitting to a printer. The data for a print generated change with printer drivers to be used. It sets in this operation gestalt and is Adobe Systems. The Postscript language of a printer, and Hewlett Packard You may be other language, although it states when using the PCL5e language of a printer. Moreover, the data generated by the printer driver are transmitted to the printer server 2 via a network 50.

[0044] First, it is received through a network 50 and a network interface 3, and the data transmitted from the host computer 1-1 are saved at (1) and a hard disk 4 (2).

[0045] The data saved in the printer server 2 at the hard disk 4 are analyzed, and the data is judged. Next, (3), When it judges whether it is data of PostScript and judges that it is data of (4) and PostScript The firmware 11 for expansion of the PostScript data saved at the hard disk 4 is read, with the data saved at the hard disk 4, it transmits to a printer 5 through a network interface 3 and a network 50, and (5) and processing are ended.

[0046] On the other hand, when judged with it not being data of PostScript at a step (4) The data saved in the printer server 2 at the hard disk 4 are analyzed, and it judges whether the data is data of PCL5e. (6), When judged with it not being data of PCL5e When judged with processing being ended and it being data of PCL5e The firmware 12 for expansion of PCL5e data is read, with the data saved at the hard disk 4, it transmits to a printer 5 through a network interface 3 and a network 50, and (7) and processing are ended.

[0047] Drawing 3 is a flow chart which shows an example of the 1st data-processing procedure of the printing system concerning this invention, and corresponds to processing of the printer 5 shown in drawing 1 . In addition, (1) - (3) shows each step. Moreover, by the printer 5, in the condition of performing neither print nor data processing, it operates by the program for actuation held at ROM7, and this program performs reception of the firmware and data which are transmitted via a network, and activation initiation of firmware.

[0048] First, if the firmware and data which were transmitted through the network 50 from the printer server 2 are received through a network interface 6, (1) and the received this firmware will be saved in the storage region (illustration ****) of a printer 5, and will start activation of the saved firmware after the completion of preservation of firmware.

[0049] And if firmware is performed, reception and the received data will be processed for the data received through the network interface 6, and image data will be generated on an image memory 9 (2). And after reception and generation of image data complete all data, firmware orders initiation of a print to the image formation section 10. Thereby, in the image formation section 10, paper is fed to the form beforehand loaded into the form cassette, and an image is formed on a form based on the image data currently held in the image memory 9, the print to which paper is delivered is performed and (3) and processing are ended. The image formation based on the data of the Page Description Language generated by the above actuation with the host computer 1-1 is completed.

[0050] According to this operation gestalt, since the program beforehand held to ROM7 of a printer 5 serves as only firmware which controls reception of firmware and data, it becomes possible [using ROM of small storage capacity].

[0051] Moreover, in order to hold all the firmware for Page Description Language processing to the printer server 2, renewal of the firmware for Page Description Language processing, modification, and an addition are easy.

[0052] Hereafter, correspondence and its operation with this operation gestalt and each process of the 5th and the 6th invention are explained with reference to drawing 2 , drawing 3 , etc.

[0053] The server equipment with which the 5th invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which judges the class of printed information from each host computer (the step (4) of drawing 2 , (5)), The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information (the step (5) of drawing 2 , (7)), Based on the analysis resource transmitted, said printed information is analyzed with said printed information. From said image formation section, CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read the image-processing process (step [of drawing 3] (1) - (3)) which generates the image data in which an output is possible, and it is performed. Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0054] The server equipment with which the 6th invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which judges the class of printed information from each host computer (the step (4) of drawing 2 , (5)), The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information (the step (5) of drawing 2 , (7)), Include the image-processing process (step [of drawing 3] (1) - (3)) which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information. The program which a computer can read is stored in a storage. That is, the gestalt which CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read, and is performed from the storage which was made to memorize the program code corresponding to the process shown in the storage resource of the external storage or the interior mentioned later at drawing 2 and drawing 3 , and memorized this program code is also included in the operation gestalt of this invention.

[0055] The [2nd operation gestalt] A system configuration and the hardware of this operation gestalt are the same as that of the 1st operation gestalt, and since only actuation of the printer server 2 and the printer 5 interior differs, and the structure of a system is the same as that of drawing 1 , explanation is omitted.

[0056] Drawing 4 is a flow chart which shows an example of the 2nd data-processing procedure of the printing system concerning this invention, and corresponds to the processing of the printer server 2 shown in drawing 1 . In addition, (1) - (10) shows each step.

[0057] First, it is received through a network 50 and a network interface 3, and the data transmitted from the host computer 1-1 are saved at (1) and a hard disk 4 (2). And in the printer server 5, the data saved at the hard disk 4 are analyzed, and the data judges the data of PostScript, and the data of PCL5e (3).

[0058] The class of firmware by which current maintenance is carried out to the printer 5 in the storage region of a printer 5 is asked. Next, (4), The judgment result in a step (3) is compared with the inquiry result (a letter is answered from a printer 5) in a step (4). It judges whether it is in agreement. (5) and in [if it judges with it being in agreement,] progressing to a step (10) and not

being in agreement with it Based on the judgment result of a step (3), it judges whether a judgment result is data of PostScript. (6), In YES, the firmware 11 for expansion of the PostScript data saved at the hard disk 4 is read, and it transmits to a printer 5 through a network interface 3 and a network 50, and progresses to henceforth [(7) and a step (10)].

[0059] On the other hand, when judged with a judgment result not being data of PostScript at a step (6) Based on the judgment result of a step (3), the firmware 12 for expansion of the PCL5e data which judge whether a judgment result is data of PCL5e, and are saved at (8) and a hard disk 4 is read. It transmits to a printer 5 through a network interface 3 and a network 50, and progresses to henceforth [(9) and a step (10)].

[0060] Next, the data saved at the hard disk 4 are read, it transmits to a printer 5 through a network interface 3 and a network 50, and (10) and processing are ended.

[0061] On the other hand, at a step (8), when judged with NO, the saved data are transmitted to a printer 5 and (10) and processing are ended.

[0062] Drawing 5 is a flow chart which shows an example of the 2nd data-processing procedure of the printing system concerning this invention, and corresponds to processing of the printer 5 shown in drawing 1 . In addition, (1) - (6) shows each step. Moreover, by the printer 5, in the condition of performing neither print nor data processing, it operates by the program for actuation held at ROM7, and this program performs reception of the firmware and data which are transmitted via the reply to an inquiry of the firmware currently held from the printer server 5 to the current storage region, and a network, and activation initiation of firmware.

[0063] During firmware activation, except, the program on this ROM is always operating, and by network interface 6 course, when a certain communications control is required, it shall not perform [except] specific processing.

[0064] First, when it judges whether there was any inquiry of the firmware currently held on the printer 5 from the printer server 2 by the network interface 6 course and judges with there having been (1) and an inquiry, the information on the firmware currently held on the printer 5 is notified to the printer server 2 (2).

[0065] On the other hand, when it judges with there having been no inquiry of firmware at a step (1) It judges whether the communication link by network interface 6 course is reception of firmware. (3), The firmware transmitted through the network 50 from the printer server 2 when it judged with it being reception of firmware is received through a network interface 6. The received this firmware is saved in the storage region (not shown) holding the firmware of a printer 5, and returns to (4) and a step (1).

[0066] On the other hand, when it judges with the communication link by network interface 6 course having been reception of data The data transmitted through the network 50 from the printer server 2 are received. The data which started the firmware held to the field holding firmware, and were received with firmware are processed. After it generates an image on an image memory 9 and reception and generation of image data complete all data, firmware orders initiation of a print to the image formation section 10. And in the image formation section 10, based on the image data currently held in the image memory 9, paper is fed to the form beforehand loaded into the form cassette, and an image is formed on a form, and the print which delivers paper is performed and it returns to (6) and a step (1).

[0067] Image formation is completed based on the data of the Page Description Language generated by the above actuation with the host computer 1-1. With this operation gestalt, the firmware transmitted immediately before is in a printer 5, and if the data which it is going to process with the firmware this time can be processed, you can understand data, without newly transmitting firmware.

[0068] Moreover, holding it, since the firmware used for the last data processing may be used for the next data processing is continued until the firmware saved in the storage region (not shown) holding firmware receives another firmware.

[0069] If it is data which can be processed with the firmware used for the last image formation according to this operation gestalt, it is possible to process data, without newly transmitting firmware. Therefore, since the time amount which downloads firmware may become unnecessary, the time amount required by the completion of data generation can be shortened.

[0070] Moreover, in order that the frequency where firmware is transmitted may decrease, there is

a merit that the amount of data which flows a network top decreases.

[0071] Hereafter, correspondence and its operation with this operation gestalt and each process of the 7th and the 8th invention are explained with reference to drawing 4 , drawing 5 , etc.

[0072] The server equipment with which the 7th invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer (step [of drawing 4] (3) - (6), (8), the step (1) of drawing 5 , (2)), The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit (the step (7) of drawing 4 , (9)), the image-processing process (the step (3) of drawing 5 —) which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read (5) and (6), and they are performed. Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side Since only printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0073] The server equipment with which the 8th invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer (step [of drawing 4] (3) - (6), (8), the step (1) of drawing 5 , (2)), The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit (the step (7) of drawing 4 , (9)), the image-processing process (the step (3) of drawing 5 —) which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information The program containing (5) and (6) which a computer can read is stored in a storage. That is, the gestalt which CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read, and is performed from the storage which was made to memorize the program code corresponding to the process shown in the storage resource of the external storage or the interior mentioned later at drawing 2 R> 2, drawing 3 , drawing 4 , and drawing 5 , and memorized this program code is also included in the operation gestalt of this invention.

[0074] The printing system hereafter applied to this invention with reference to the memory map shown in drawing 6 explains the configuration of the data-processing program which can be read.

[0075] Drawing 6 is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read by the printing system concerning this invention.

[0076] In addition, although it does not illustrate especially, the information for which the information which manages the program group memorized by the storage, for example, version information, an implementer, etc. are memorized, and it depends on OS by the side of program read-out etc., for example, the icon which indicates the program by discernment, may be memorized.

[0077] Furthermore, the data subordinate to various programs are also managed to the above-

mentioned directory. Moreover, the program for installing various programs in a computer, the program thawed when the program to install is compressed may be memorized.

[0078] The function shown in drawing 2 in this operation gestalt, drawing 3, drawing 4, and drawing 5 R> 5 may be carried out with the host computer by the program installed from the outside. And this invention is applied even when the information group which includes a program from an external storage is supplied by the output unit through storages, such as CD-ROM, a flash memory, and FD, or a network in that case.

[0079] As mentioned above, it cannot be overemphasized by supplying the storage which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and carrying out read-out activation of the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage that the purpose of this invention is attained.

[0080] In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.

[0081] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, EEPROM, etc. can be used, for example.

[0082] Moreover, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that OS (operating system) which is working on a computer is actual, based on directions of the program code, and the function of the operation gestalt mentioned above by performing the program code which the computer read is not only realized, but was mentioned above by the processing is realized.

[0083] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the functional add-in board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[0084] Moreover, with the above-mentioned operation gestalt, although the image formation method is not specified, this invention is applicable to the printer control unit which controls the printer engine of an image formation method with various laser beam methods, LED printers, ink jet methods, etc.

[0085] Furthermore, although the above-mentioned operation gestalt explained the case where the output destination change of image data was made into the image formation section, an output destination change is not limited to a printer and can be applied to image display devices, such as CRT, etc.

[0086] Moreover, constituting from a DRAM, FlashROM, a hard disk, etc. is also possible also about the field which memorizes a processing module (analysis resource) temporarily by the printer side.

[0087] Furthermore, although the above-mentioned operation gestalt explained the case where analysis resources were PostScript for printers, and PCL5e While being able to respond to various language for image drawing, such as logical-inference-per-second language by Canon, Inc., and a Windows GDI command by Microsoft Corp. By preparing each processing module (analysis resource) which receives image data, such as JPEG, GIF, TIFF, etc. which are the compression method of an image when printing an image, and forms an image, and applying this invention Not only a Page Description Language but the thing for which an image is generated based on the image data of various formats becomes possible.

[0088]

[Effect of the Invention] As explained above, according to the 1st invention concerning this invention, the class of said printed information by which the judgment means by the side of server equipment was saved for the preservation means is judged. It transmits to said printer control unit with said printed information which chose the optimal analysis resource for a transfer means to analyze said printed information based on this judgment result from said storage means, and was saved for said preservation means. Since an image-processing means analyzes said printed information and generates the image data in which an output is possible from said image formation

section based on the analysis resource transmitted with said printed information from said server equipment by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0089] According to the 2nd invention, the collating judging of the class of analysis resource with which the judgment means by the side of server equipment is acquired from the class and said print control unit of said printed information saved for the preservation means is carried out. With said printed information which chose the optimal analysis resource for a transfer means to analyze said printed information based on this judgment result from said storage means, and was saved for said preservation means Or said printed information saved for said preservation means is transmitted to said printer control unit. Since an image-processing means analyzes said printed information and generates the image data in which an output is possible from said image formation section based on the analysis resource transmitted with said printed information from said server equipment by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side Since only printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0090] According to the 3rd invention, since said judgment means catches and judges the class of Page Description Language of said printed information, it can specify the optimal analysis resource which should analyze the printed information based on various Page Description Languages.

[0091] According to the 4th invention, since the class of data compression method of said printed information is judged, said judgment means can specify the optimal analysis resource which should analyze the printed information based on various data compression methods.

[0092] According to the 5th and 6th invention, the class of printed information from each host computer is judged. Choose the optimal analysis resource for analyzing said printed information based on this judgment result, and it transmits to said printer control unit with said printed information. Since said printed information is analyzed based on the analysis resource transmitted and the image data in which an output is possible is generated from said image formation section with said printed information Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0093] According to the 7th and 8th invention, the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer is carried out. The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or since said printed information is analyzed based on the analysis resource which transmits said printed information to said printer control unit, and is transmitted with said printed information and the image data in which an output is possible is generated from said image formation section Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side Since only

printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0094] Therefore, even if modification of the analysis resource for analyzing various printed information and the class of analysis resource increase, the effectiveness of being able to make into the minimum the memory burden which a print control unit side should be secured is done so.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the storage which stored the program which the printing control approach and computer of the printing control system with which the server equipment which manages the printed information from two or more host computers through predetermined communication media, and the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and a printing control system can read.

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PRIOR ART

[Description of the Prior Art] The network printer is general as a printer which prints the document conventionally drawn up using the computer etc. and which is shared by two or more users.

[0003] This is the gestalt of connecting one or more sets of the printer server which holds a print job temporarily, and printers with two or more host computers which each user uses by the network, and transmitting and printing print data on a printer via a printer server.

[0004] Moreover, recently, it is Adobe Systems with one printer. Shrine "PostScript" language and Hewlett Packard Two Page Description Languages of shrine "PCL5e" language are processed, the printer which can generate image data is common, and the printer which judges which data of these two Page Description Languages it is, and is processed from the contents of the received data is general.

[0005] Drawing 7 is a block diagram explaining this kind of printer structure of a system.

[0006] In drawing 7, 1-1 and 1-2 are host computers, and are constituted possible [a communication link of the printer server 2 and a printer 5] through the network 50.

[0007] In the printer server 2, 3 is a network interface and performs the communication link with a network 50. 4 is a hard disk and spools a host computer 1-1 and the printing demand from 1-2.

[0008] In a printer 5, 6 is a network interface and performs the communication link with a network 50. 7 is ROM and has memorized various kinds of control programs which CPU8 should perform, data, font data, etc. 9 is an image memory and carries out the specified quantity storage of the image data which CPU8 drew based on the printed information which received through the network interface 6 and which can be printed. 10 is the image formation section (printer engine), and prints to a record medium based on the image data memorized in the image memory 9.

[0009] In addition, the firmware for a judgment which judges the class of received data on ROM7, the firmware which processes the data of PostScript language and generates image data, and the firmware which processes the data of PCL5e language and generates image data are saved.

Hereafter, the case where it prints by the printer 5 from a host computer 1-1 is explained.

[0010] Drawing 8 is a flow chart which shows an example of the data-processing procedure of the printer server 2 shown in drawing 7. In addition, (1) - (3) shows each step. Moreover, if the user of a host computer 1-1 directs a print in a host computer 1-1, the data for a print will be generated by the printer driver which generates the data for transmitting to a printer 5. In addition, the data for a print generated change with printer drivers to be used. It sets to this example and is Adobe Systems. The PostScript language of a shrine, and Hewlett Packard The case where PCL5e of a shrine is used is described.

[0011] First, the data generated by the printer driver are transmitted to the printer server 2 via a network 50, and the document data sent through a network 50 are received by network interface 3 course at the printer server 2 (1). Subsequently, in the printer server 2, the received data are once saved at a hard disk 4 (2).

[0012] Then, the data saved at the hard disk 4 are sent to a printer 5 by network interface 3 and network 50 course, and end (3) and processing.

[0013] Drawing 9 is a flow chart which shows an example of the data-processing procedure of the printer 5 shown in drawing 7. In addition, (1) - (7) shows each step.

[0014] The data transmitted from the printer server 2 by the printer 5 are received. First, (1), The

received data are analyzed. In the data of (2) and PostScript language When it judges whether it is data of PCL5e language and is judged with (3) and the received data being data of PostScript language The firmware which processes the data of PostScript language is started, data are processed, image data is generated on an image memory 9, and it progresses after (4) and a step (7).

[0015] On the other hand, when it judges whether it is data of PCL5e language when judged with NO and is judged with it being the language of (5) and PCL5e at a step (3), the firmware which processes the data of PCL5e language is started, data are processed, and image data is generated on an image memory 9 (6). Subsequently, an image is formed on a form by the image formation section 10 based on the image data generated on the image memory 9, and (10) and processing are ended.

[0016] On the other hand, when judged with it not being the language of PCL5e at a step (5), it prints at a step (7) as what received image data, and processing is ended.

[0017] Thus, after saving temporarily a host computer 1-1 and the data of the Page Description Language generated by 1-2 at a printer server, it is possible to transmit to a printer 5, to process with the firmware for Page Description Language processing, to generate image data, and to form an image.

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, according to the 1st invention concerning this invention, the class of said printed information by which the judgment means by the side of server equipment was saved for the preservation means is judged. It transmits to said printer control unit with said printed information which chose the optimal analysis resource for a transfer means to analyze said printed information based on this judgment result from said storage means, and was saved for said preservation means. Since an image-processing means analyzes said printed information and generates the image data in which an output is possible from said image formation section based on the analysis resource transmitted with said printed information from said server equipment by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0089] According to the 2nd invention, the collating judging of the class of analysis resource with which the judgment means by the side of server equipment is acquired from the class and said print control unit of said printed information saved for the preservation means is carried out. With said printed information which chose the optimal analysis resource for a transfer means to analyze said printed information based on this judgment result from said storage means, and was saved for said preservation means Or said printed information saved for said preservation means is transmitted to said printer control unit. Since an image-processing means analyzes said printed information and generates the image data in which an output is possible from said image formation section based on the analysis resource transmitted with said printed information from said server equipment by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side Since only printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0090] According to the 3rd invention, since said judgment means catches and judges the class of Page Description Language of said printed information, it can specify the optimal analysis resource which should analyze the printed information based on various Page Description Languages.

[0091] According to the 4th invention, since the class of data compression method of said printed information is judged, said judgment means can specify the optimal analysis resource which should analyze the printed information based on various data compression methods.

[0092] According to the 5th and 6th invention, the class of printed information from each host computer is judged. Choose the optimal analysis resource for analyzing said printed information based on this judgment result, and it transmits to said printer control unit with said printed

information. Since said printed information is analyzed based on the analysis resource transmitted and the image data in which an output is possible is generated from said image formation section with said printed information Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0093] According to the 7th and 8th invention, the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer is carried out. The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or since said printed information is analyzed based on the analysis resource which transmits said printed information to said printer control unit, and is transmitted with said printed information and the image data in which an output is possible is generated from said image formation section Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side Since only printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0094] Therefore, even if modification of the analysis resource for analyzing various printed information and the class of analysis resource increase, the effectiveness of being able to make into the minimum the memory burden which a print control unit side should be secured is done so.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, since the program of a printer of operation is memorized by ROM8 in a printer, in order to update the program for actuation, exchange of ROM8 is needed. As for the renewal of the program for actuation of further two or more printers, ROM exchange of each printer is needed.

[0019] Moreover, in the case of the printer which supports two or more Page Description Languages, since it is necessary to memorize the program of operation for each Page Description Languages to ROM of a printer, mass ROM is needed.

[0020] Furthermore, since the received document data need to judge [in / for of which Page Description Language it is document data / a printer] in the case of the printer which supports two or more Page Description Languages, it is necessary to include the function of a Page Description Language judging in the program for actuation of a printer.

[0021] Moreover, since the free areas of ROM for memorizing the program of operation run short when supporting a new Page Description Language, it is necessary to redesign the circuit which can mount mass ROM.

[0022] Furthermore, when it was the system to which two or more printers are connected, since ROM was needed for all printers and many ROMs were needed as the whole system, there were troubles, such as becoming a cost rise.

[0023] The purpose of the 1st invention which was made in order that this invention might cancel the above-mentioned trouble, and relates to this invention – the 8th invention By acquiring the analysis resource for analyzing various printed information from server equipment, and making recombination of it possible with printed information Modification of the analysis resource for analyzing various printed information, Even if the class of analysis resource increases, it is offering the storage which stored the program which the printing control approach and computer of the printing control system which can make the minimum the memory burden which a print control unit side's should be secured, and a printing control system can read.

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MEANS

[Means for Solving the Problem] The server equipment with which the 1st invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, A preservation means to be the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and to save the printed information from each host computer, A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs, A judgment means to judge the class of said printed information saved for said preservation means, The server equipment which has a transfer means to transmit to said printer control device with said printed information which chose the optimal analysis resource for analyzing said printed information based on the judgment result of said judgment means from said storage means, and was saved for said preservation means, It has the print control unit which has an image-processing means to analyze said printed information based on the analysis resource transmitted with said printed information from said server equipment, and to generate the image data in which an output is possible from said image formation section.

[0025] The server equipment with which the 2nd invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, A preservation means to be the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate, and to save the printed information from each host computer, A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs, The judgment means which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information saved for said preservation means, With said printed information which chose the optimal analysis resource for analyzing said printed information based on the collating judging result of said judgment means from said storage means, and was saved for said preservation means Or the server equipment which has a transfer means to transmit said printed information saved for said preservation means to said printer control device, It has the print control unit which has an image-processing means to analyze said printed information based on the analysis resource transmitted with said printed information from said server equipment, and to generate the image data in which an output is possible from said image formation section.

[0026] As for said judgment means, the 3rd invention concerning this invention judges the class of Page Description Language of said printed information.

[0027] As for said judgment means, the 4th invention concerning this invention judges the class of data compression method of said printed information.

[0028] The server equipment with which the 5th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which judges the class of printed information from each host computer, The transfer process which chooses the

optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information, It has the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information.

[0029] The server equipment with which the 6th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which judges the class of printed information from each host computer, The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information, The program including the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information which a computer can read is stored in a storage.

[0030] The server equipment with which the 7th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer, The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or it has the transfer process which transmits said printed information to said printer control unit, and the image-processing process which analyzes said printed information based on the analysis resource transmitted with said printed information, and generates the image data in which an output is possible from said image formation section.

[0031] The server equipment with which the 8th invention concerning this invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer, The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit, The program including the image-processing process which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information which a computer can read is stored in a storage.

[0032]

[Embodiment of the Invention]

The [1st operation gestalt] Drawing 1 is a block diagram explaining the printing structure of a system which shows the 1st operation gestalt of this invention, and has given the same sign to the same thing as drawing 7.

[0033] In drawing 1, 1-1 and 1-2 draw up the document to print, and it is a printer server, and the host computer which generates the data for a print, and 2 hold the firmware for actuation of a host computer 1-1, the data transmitted from 1-2, and a printer, and transmit to a printer 5. 3 is a network interface and controls a transfer of the data through a network 50, and firmware. 4 is a hard disk and holds data and firmware. 5 is a printer, it arranges data with firmware, generates an image, and performs image formation on a form.

[0034] 6 is a network interface and controls a transfer of the data through a network 50, and firmware. 7 is ROM and holds the program which controls a transfer of data and firmware.

[0035] 8 is CPU and performs firmware of a printer 5 based on the control program memorized by ROM7. 9 is an image memory and holds image data. 10 is the image formation section and forms an image on a form based on the image data formed on the image memory 9. 50 is a network for combining computers and printers, such as Ethernet. 51 is a hard disk interface and 52 is a CPU bus.

[0036] In addition, the PostScript firmware 11 for the printers for processing data in a printer 5 to a hard disk 4, and generating image data (the 1st firmware) and the firmware 12 for PCL5e (the 1st firmware) shall be saved.

[0037] Hereafter, correspondence and its operation with this operation gestalt and each means of the 1st – the 4th invention are explained with reference to drawing 1 etc.

[0038] The server equipment (printer server 2) with which the 1st invention manages two or more host computers 1-1 and the printed information from 1-2 through predetermined communication media (network 50). It is the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. A preservation means to save the printed information from each host computer (hard disk 4). A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs (hard disk 4). A judgment means to judge the class of said printed information saved for said preservation means (CPU which the printer server 2 does not illustrate). With said printed information which chose the optimal analysis resource for analyzing said printed information based on the judgment result of said judgment means from said storage means, and was saved for said preservation means The server equipment which has a transfer means (CPU which the printer server 2 does not illustrate) to transmit to said printer control device. Based on the analysis resource transmitted with said printed information, said printed information is analyzed from said server equipment. It has the print control unit which has an image-processing means (CPU8 performs and processes the control program memorized by ROM7) to generate the image data in which an output is possible from said image formation section. The class of said printed information by which CPU by the side of server equipment was saved at the hard disk 4 is judged. The optimal firmwares 11 and 12 for a transfer means to analyze said printed information based on this judgment result are transmitted to said printer control unit with the printed information saved by choosing from a hard disk 4. Since CPU8 analyzes said printed information and generates the image data in which an output is possible from said image formation section 10 based on the firmware transmitted with said printed information from the printer server 2 by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0039] The server equipment with which the 2nd invention manages two or more host computers 1-1 and the printed information from 1-2 through predetermined communication media (network 50). It is the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section 10 can communicate. A preservation means to save the printed information from each host computer (hard disk 4). A storage means to memorize the analysis resource with which the classification for carrying out analysis processing of said printed information differs (hard disk 4). The judgment means which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information saved for said preservation means (CPU which the printer server 2 does not illustrate). With said printed information which chose the optimal analysis resource for analyzing said printed information based on the collating judging result of said judgment means from said storage means, and was saved for said preservation means Or the server equipment which has a transfer means (CPU which the printer server 2 does not illustrate) to transmit said printed information saved for said preservation means to said printer control device. Based on the analysis resource transmitted with said printed information, said printed information is analyzed from said server equipment. It has the print

control unit which has an image-processing means (CPU8 performs and processes the control program memorized by ROM7) to generate the image data in which an output is possible from said image formation section. The collating judging of the class of analysis resource with which CPU which the printer server 2 does not illustrate is acquired from the class and said print control unit of said printed information saved at the hard disk 4 is carried out. With said printed information saved by choosing from a hard disk 4, the optimal analysis resource for analyzing printed information based on this judgment result Or said printed information saved at the hard disk 4 is transmitted to said printer control unit. Since CPU8 analyzes said printed information and generates the image data in which an output is possible from said image formation section based on the analysis resource transmitted with said printed information from said server equipment by the side of said printer control device Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side Since only printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0040] Since said judgment means catches and judges the class of Page Description Language of said printed information, the 3rd invention can specify the optimal analysis resource which should analyze the printed information based on various Page Description Languages.

[0041] Since said judgment means judges the class of data compression method of said printed information, the 4th invention can specify the optimal analysis resource which should analyze the printed information based on various data compression methods.

[0042] Drawing 2 is a flow chart which shows an example of the 1st data-processing procedure of the printing system concerning this invention, and corresponds to the processing of the printer server 2 shown in drawing 1 . In addition, (1) - (7) shows each step.

[0043] In addition, if the user of a host computer 1-1 directs a print in a host computer 1-1, the data for a print will be generated by the printer driver which generates the data for transmitting to a printer. The data for a print generated change with printer drivers to be used. It sets in this operation gestalt and is Adobe Systems. The Postscript language of a shrine, and Hewlett Packard You may be other language, although it states when using the PCL5e language of a shrine. Moreover, the data generated by the printer driver are transmitted to the printer server 2 via a network 50.

[0044] First, it is received through a network 50 and a network interface 3, and the data transmitted from the host computer 1-1 are saved at (1) and a hard disk 4 (2).

[0045] The data saved in the printer server 2 at the hard disk 4 are analyzed, and the data is judged. Next, (3), When it judges whether it is data of PostScript and judges that it is data of (4) and PostScript The firmware 11 for expansion of the PostScript data saved at the hard disk 4 is read, with the data saved at the hard disk 4, it transmits to a printer 5 through a network interface 3 and a network 50, and (5) and processing are ended.

[0046] On the other hand, when judged with it not being data of PostScript at a step (4) The data saved in the printer server 2 at the hard disk 4 are analyzed, and it judges whether the data is data of PCL5e. (6), When judged with it not being data of PCL5e When judged with processing being ended and it being data of PCL5e The firmware 12 for expansion of PCL5e data is read, with the data saved at the hard disk 4, it transmits to a printer 5 through a network interface 3 and a network 50, and (7) and processing are ended.

[0047] Drawing 3 is a flow chart which shows an example of the 1st data-processing procedure of the printing system concerning this invention, and corresponds to processing of the printer 5 shown in drawing 1 . In addition, (1) - (3) shows each step. Moreover, by the printer 5, in the condition of performing neither print nor data processing, it operates by the program for actuation held at ROM7, and this program performs reception of the firmware and data which are transmitted via a network, and activation initiation of firmware.

[0048] First, if the firmware and data which were transmitted through the network 50 from the printer server 2 are received through a network interface 6, (1) and the received this firmware will be saved in the storage region (illustration ****) of a printer 5, and will start activation of the saved firmware after the completion of preservation of firmware.

[0049] And if firmware is performed, reception and the received data will be processed for the data received through the network interface 6, and image data will be generated on an image memory 9 (2). And after reception and generation of image data complete all data, firmware orders initiation of a print to the image formation section 10. Thereby, in the image formation section 10, paper is fed to the form beforehand loaded into the form cassette, and an image is formed on a form based on the image data currently held in the image memory 9, the print to which paper is delivered is performed and (3) and processing are ended. The image formation based on the data of the Page Description Language generated by the above actuation with the host computer 1-1 is completed.

[0050] According to this operation gestalt, since the program beforehand held to ROM7 of a printer 5 serves as only firmware which controls reception of firmware and data, it becomes possible [using ROM of small storage capacity].

[0051] Moreover, in order to hold all the firmware for Page Description Language processing to the printer server 2, renewal of the firmware for Page Description Language processing, modification, and an addition are easy.

[0052] Hereafter, correspondence and its operation with this operation gestalt and each process of the 5th and the 6th invention are explained with reference to drawing 2 , drawing 3 , etc.

[0053] The server equipment with which the 5th invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which judges the class of printed information from each host computer (the step (4) of drawing 2 , (5)), The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information (the step (5) of drawing 2 , (7)), Based on the analysis resource transmitted, said printed information is analyzed with said printed information. From said image formation section, CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read the image-processing process (step [of drawing 3] (1) - (3)) which generates the image data in which an output is possible, and it is performed. Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded Based on the always optimal analysis resource, image data can be cheaply generated from printed information, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side.

[0054] The server equipment with which the 6th invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which judges the class of printed information from each host computer (the step (4) of drawing 2 , (5)), The transfer process which chooses the optimal analysis resource for analyzing said printed information based on this judgment result, and is transmitted to said printer control unit with said printed information (the step (5) of drawing 2 , (7)), Include the image-processing process (step [of drawing 3] (1) - (3)) which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information. The program which a computer can read is stored in a storage. That is, the gestalt which CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read, and is performed from the storage which was made to memorize the program code corresponding to the process shown in the storage resource of the external storage or the interior mentioned later at drawing 2 and drawing 3 , and memorized this program code is also included in the operation gestalt of this invention.

[0055] The [2nd operation gestalt] A system configuration and the hardware of this operation gestalt are the same as that of the 1st operation gestalt, and since only actuation of the printer server 2 and the printer 5 interior differs, and the structure of a system is the same as that of drawing 1 , explanation is omitted.

[0056] Drawing 4 is a flow chart which shows an example of the 2nd data-processing procedure of the printing system concerning this invention, and corresponds to the processing of the printer server 2 shown in drawing 1 . In addition, (1) – (10) shows each step.

[0057] First, it is received through a network 50 and a network interface 3, and the data transmitted from the host computer 1-1 are saved at (1) and a hard disk 4 (2). And in the printer server 5, the data saved at the hard disk 4 are analyzed, and the data judges the data of PostScript, and the data of PCL5e (3).

[0058] The class of firmware by which current maintenance is carried out to the printer 5 in the storage region of a printer 5 is asked. Next, (4), The judgment result in a step (3) is compared with the inquiry result (a letter is answered from a printer 5) in a step (4). It judges whether it is in agreement. (5) and in [if it judges with it being in agreement,] progressing to a step (10) and not being in agreement with it Based on the judgment result of a step (3), it judges whether a judgment result is data of PostScript. (6), In YES, the firmware 11 for expansion of the PostScript data saved at the hard disk 4 is read, and it transmits to a printer 5 through a network interface 3 and a network 50, and progresses to henceforth [(7) and a step (10)].

[0059] On the other hand, when judged with a judgment result not being data of PostScript at a step (6) Based on the judgment result of a step (3), the firmware 12 for expansion of the PCL5e data which judge whether a judgment result is data of PCL5e, and are saved at (8) and a hard disk 4 is read. It transmits to a printer 5 through a network interface 3 and a network 50, and progresses to henceforth [(9) and a step (10)].

[0060] Next, the data saved at the hard disk 4 are read, it transmits to a printer 5 through a network interface 3 and a network 50, and (10) and processing are ended.

[0061] On the other hand, at a step (8), when judged with NO, the saved data are transmitted to a printer 5 and (10) and processing are ended.

[0062] Drawing 5 is a flow chart which shows an example of the 2nd data-processing procedure of the printing system concerning this invention, and corresponds to processing of the printer 5 shown in drawing 1 . In addition, (1) – (6) shows each step. Moreover, by the printer 5, in the condition of performing neither print nor data processing, it operates by the program for actuation held at ROM7, and this program performs reception of the firmware and data which are transmitted via the reply to an inquiry of the firmware currently held from the printer server 5 to the current storage region, and a network, and activation initiation of firmware.

[0063] During firmware activation, except, the program on this ROM is always operating, and by network interface 6 course, when a certain communications control is required, it shall not perform [except] specific processing.

[0064] First, when it judges whether there was any inquiry of the firmware currently held on the printer 5 from the printer server 2 by the network interface 6 course and judges with there having been (1) and an inquiry, the information on the firmware currently held on the printer 5 is notified to the printer server 2 (2).

[0065] On the other hand, when it judges with there having been no inquiry of firmware at a step (1) It judges whether the communication link by network interface 6 course is reception of firmware. (3), The firmware transmitted through the network 50 from the printer server 2 when it judged with it being reception of firmware is received through a network interface 6. The received this firmware is saved in the storage region (not shown) holding the firmware of a printer 5, and returns to (4) and a step (1).

[0066] On the other hand, when it judges with the communication link by network interface 6 course having been reception of data The data transmitted through the network 50 from the printer server 2 are received. The data which started the firmware held to the field holding firmware, and were received with firmware are processed. After it generates an image on an image memory 9 and reception and generation of image data complete all data, firmware orders initiation of a print to the image formation section 10. And in the image formation section 10, based on the image data currently held in the image memory 9, paper is fed to the form beforehand loaded into

the form cassette, and an image is formed on a form, and the print which delivers paper is performed and it returns to (6) and a step (1).

[0067] Image formation is completed based on the data of the Page Description Language generated by the above actuation with the host computer 1-1. With this operation gestalt, the firmware transmitted immediately before is in a printer 5, and if the data which it is going to process with the firmware this time can be processed, you can understand data, without newly transmitting firmware.

[0068] Moreover, holding it, since the firmware used for the last data processing may be used for the next data processing is continued until the firmware saved in the storage region (not shown) holding firmware receives another firmware.

[0069] If it is data which can be processed with the firmware used for the last image formation according to this operation gestalt, it is possible to process data, without newly transmitting firmware. Therefore, since the time amount which downloads firmware may become unnecessary, the time amount required by the completion of data generation can be shortened.

[0070] Moreover, in order that the frequency where firmware is transmitted may decrease, there is a merit that the amount of data which flows a network top decreases.

[0071] Hereafter, correspondence and its operation with this operation gestalt and each process of the 7th and the 8th invention are explained with reference to drawing 4, drawing 5, etc.

[0072] The server equipment with which the 7th invention manages the printed information from two or more host computers through predetermined communication media, It is the printing control approach of a printing control system that the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer (step [of drawing 4] (3) - (6), (8), the step (1) of drawing 5, (2)), The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit (the step (7) of drawing 4, (9)), the image-processing process (the step (3) of drawing 5 —) which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read (5) and (6), and they are performed. Even if the analysis resources of a different class which carries out analysis processing of the printed information transmitted from server equipment increase in number or the contents of the analysis resource of the same kind are upgraded While being able to generate image data cheaply from printed information based on the always optimal analysis resource, without increasing the quantity of the analysis resource memory capacity which should be secured to a print control unit side Since only printed information is transmitted without resending the same analysis resource when the analysis resource which analyzes the printed information transmitted from server equipment is already memorized at the print control unit side, the processing time until it obtains the output of this printed information can be shortened sharply.

[0073] The server equipment with which the 8th invention manages the printed information from two or more host computers through predetermined communication media, It is the storage which stored the program which the computer which controls the printing control system with which the print control unit which analyzes said printed information transmitted from said server equipment, and controls the output from the image formation section can communicate can read. The judgment process which carries out the collating judging of the class of analysis resource acquired from the class and said print control unit of said printed information from each host computer (step [of drawing 4] (3) - (6), (8), the step (1) of drawing 5, (2)), The optimal analysis resource for analyzing said printed information based on this judgment result is chosen. With said printed information Or the transfer process which transmits said printed information to said printer control unit (the step (7) of drawing 4, (9)), the image-processing process (the step (3) of drawing 5 —) which analyzes said printed information based on the analysis resource transmitted, and generates the image data in which an output is possible from said image formation section with said printed information The program containing (5) and (6) which a computer can read is stored in a storage.

That is, the gestalt which CPU which the printer server 2 does not illustrate, and CPU8 of a printer 5 read, and is performed from the storage which was made to memorize the program code corresponding to the process shown in the storage resource of the external storage or the interior mentioned later at drawing 2 R> 2, drawing 3, drawing 4, and drawing 5, and memorized this program code is also included in the operation gestalt of this invention.

[0074] The printing system hereafter applied to this invention with reference to the memory map shown in drawing 6 explains the configuration of the data-processing program which can be read.

[0075] Drawing 6 is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read by the printing system concerning this invention.

[0076] In addition, although it does not illustrate especially, the information for which the information which manages the program group memorized by the storage, for example, version information, an implementer, etc. are memorized, and it depends on OS by the side of program read-out etc., for example, the icon which indicates the program by discernment, may be memorized.

[0077] Furthermore, the data subordinate to various programs are also managed to the above-mentioned directory. Moreover, the program for installing various programs in a computer, the program thawed when the program to install is compressed may be memorized.

[0078] The function shown in drawing 2 in this operation gestalt, drawing 3, drawing 4, and drawing 5 R> 5 may be carried out with the host computer by the program installed from the outside. And this invention is applied even when the information group which includes a program from an external storage is supplied by the output unit through storages, such as CD-ROM, a flash memory, and FD, or a network in that case.

[0079] As mentioned above, it cannot be overemphasized by supplying the storage which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and carrying out read-out activation of the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage that the purpose of this invention is attained.

[0080] In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.

[0081] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, EEPROM, etc. can be used, for example.

[0082] Moreover, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that OS (operating system) which is working on a computer is actual, based on directions of the program code, and the function of the operation gestalt mentioned above by performing the program code which the computer read is not only realized, but was mentioned above by the processing is realized.

[0083] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the functional add-in board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[0084] Moreover, with the above-mentioned operation gestalt, although the image formation method is not specified, this invention is applicable to the printer control unit which controls the printer engine of an image formation method with various laser beam methods, LED printers, ink jet methods, etc.

[0085] Furthermore, although the above-mentioned operation gestalt explained the case where the output destination change of image data was made into the image formation section, an output destination change is not limited to a printer and can be applied to image display devices, such as CRT, etc.

[0086] Moreover, constituting from a DRAM, FlashROM, a hard disk, etc. is also possible also about the field which memorizes a processing module (analysis resource) temporarily by the printer side.

[0087] Furthermore, although the above-mentioned operation gestalt explained the case where

analysis resources were PostScript for printers, and PCL5e While being able to respond to various language for image drawing, such as logical-inference-per-second language by Canon, Inc., and a Windows GDI command by Microsoft Corp. By preparing each processing module (analysis resource) which receives image data, such as JPEG, GIF, TIFF, etc. which are the compression method of an image when printing an image, and forms an image, and applying this invention Not only a Page Description Language but the thing for which an image is generated based on the image data of various formats becomes possible.

[Translation done.]

*** NOTICES ***

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a block diagram explaining the printing structure of a system which shows the 1st operation gestalt of this invention.

[Drawing 2] It is the flow chart which shows an example of the 1st data-processing procedure of the printing system concerning this invention.

[Drawing 3] It is the flow chart which shows an example of the 1st data-processing procedure of the printing system concerning this invention.

[Drawing 4] It is the flow chart which shows an example of the 2nd data-processing procedure of the printing system concerning this invention.

[Drawing 5] It is the flow chart which shows an example of the 2nd data-processing procedure of the printing system concerning this invention.

[Drawing 6] It is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read by the printing system concerning this invention.

[Drawing 7] It is a block diagram explaining the printer structure of a system of ****.

[Drawing 8] It is the flow chart which shows an example of the data-processing procedure of a printer server shown in drawing 7.

[Drawing 9] It is the flow chart which shows an example of the data-processing procedure of the printer shown in drawing 7.

[Description of Notations]

1-1 Host Computer

1-1 Host Computer

2 Printer Server

3 Network Interface

4 Hard Disk

5 Printer

6 Network Interface

7 ROM

8 CPU

9 Image Memory

10 Image Formation Section

11 1st Firmware

12 2nd Firmware

[Translation done.]

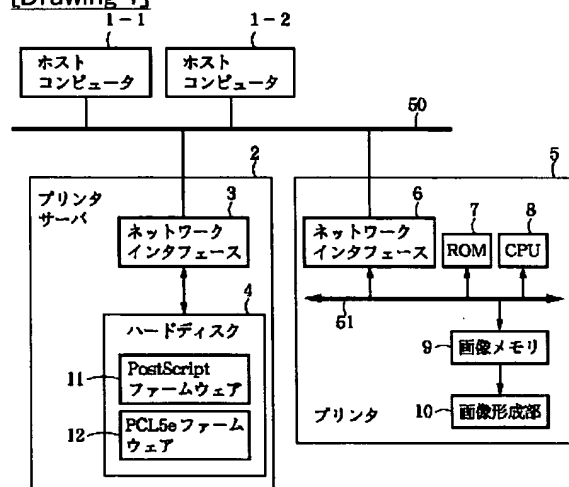
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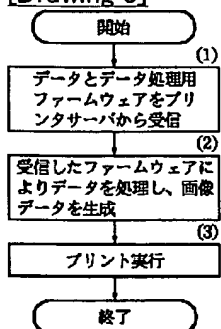
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

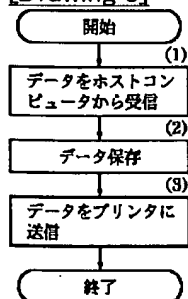
[Drawing 1]



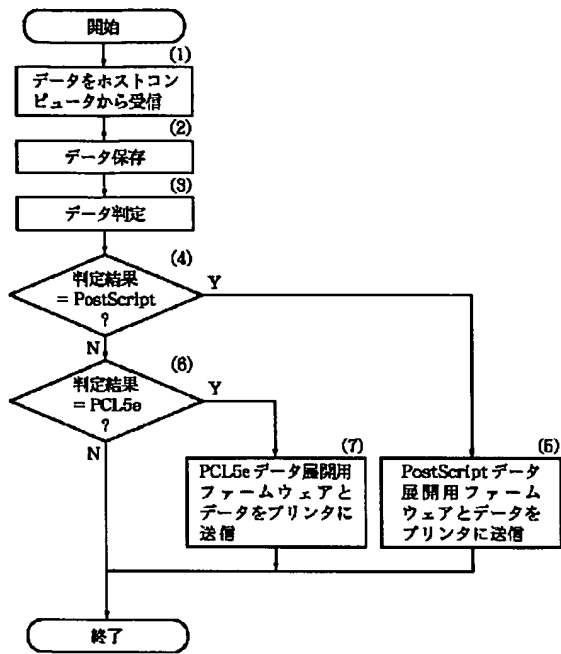
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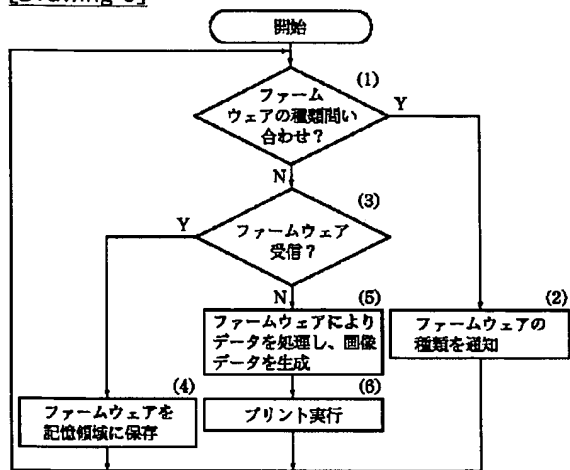
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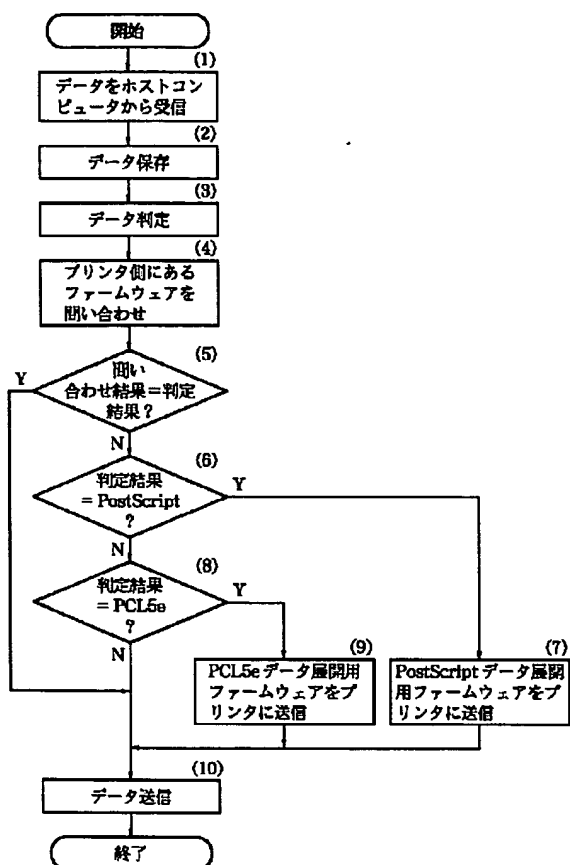
[Drawing 2]



[Drawing 5]



[Drawing 4]



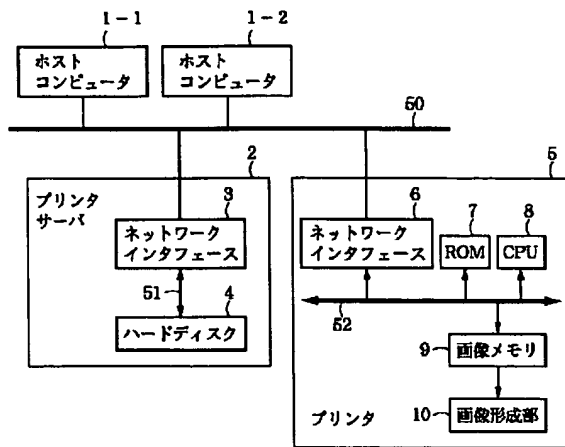
[Drawing 6]

FD/CD-ROM等の記憶媒体

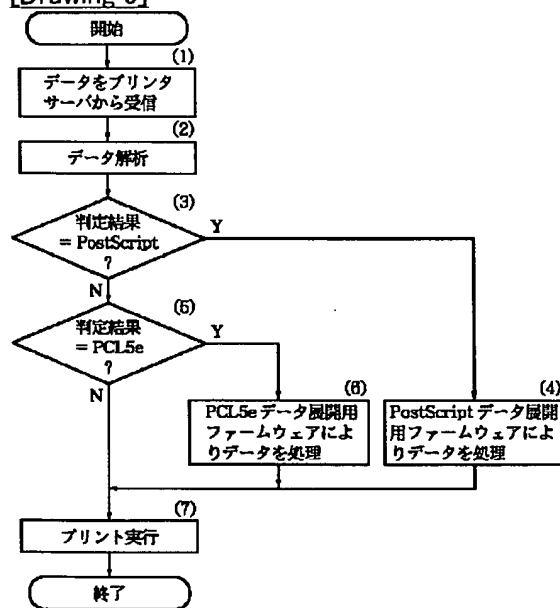
ディレクトリ情報
第1のデータ処理プログラム 図2に示すフローチャートのステップに対応するプログラムコード群
第2のデータ処理プログラム 図3に示すフローチャートのステップに対応するプログラムコード群
第3のデータ処理プログラム 図4に示すフローチャートのステップに対応するプログラムコード群
第4のデータ処理プログラム 図5に示すフローチャートのステップに対応するプログラムコード群

記憶媒体のメモリマップ

[Drawing 7]



[Drawing 9]



[Translation done.]

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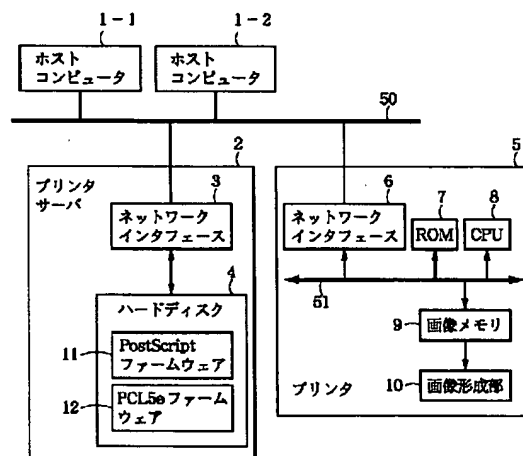
(74) 代理人 弁理士 小林 将高

(54) 【発明の名称】 印刷制御システムおよび印刷制御システムの印刷制御方法およびコンピュータが読み出し可能なプログラムを格納した記憶媒体

(57) 【要約】

【課題】 種々の印刷情報を解析するための解析資源の変更や、解析資源の種類が増えても印刷制御装置側に確保すべきメモリ負担を最小限とすることである。

【解決手段】 サーバ装置側のCPUがハードディスク4に保存された前記印刷情報の種類を判定し、該判定結果に基づいて転送手段が前記印刷情報を解析するための最適なファームウェア11、12をハードディスク4から選択して保存された印刷情報とともに前記プリンタ制御装置に転送し、前記プリンタ制御装置側のプリンタサーバ2から前記印刷情報とともに転送されるファームウェアに基づいてCPU8が前記印刷情報を解析して前記画像形成部10から出力可能な画像データを生成する構成を特徴とする。



【特許請求の範囲】

【請求項1】 所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムであって、各ホストコンピュータからの印刷情報を保存する保存手段と、前記印刷情報を解析処理するための種別の異なる解析資源を記憶する記憶手段と、前記保存手段に保存された前記印刷情報の種類を判定する判定手段と、前記判定手段の判定結果に基づいて前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに前記プリンタ制御装置に転送する転送手段とを有するサーバ装置と、前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理手段を有する印刷制御装置と、を備えることを特徴とする印刷制御システム。

【請求項2】 所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムであって、各ホストコンピュータからの印刷情報を保存する保存手段と、前記印刷情報を解析処理するための種別の異なる解析資源を記憶する記憶手段と、前記保存手段に保存された前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定手段と、前記判定手段の照合判定結果に基づいて前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに、あるいは前記保存手段に保存された前記印刷情報を前記プリンタ制御装置に転送する転送手段とを有するサーバ装置と、前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理手段を有する印刷制御装置と、を備えることを特徴とする印刷制御システム。

【請求項3】 前記判定手段は、前記印刷情報のページ記述言語の種類を判定することを特徴とする請求項1または2記載の印刷制御システム。

【請求項4】 前記判定手段は、前記印刷情報のデータ圧縮方式の種類を判定することを特徴とする請求項1

または2記載の印刷制御システム。

【請求項5】 所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムの印刷制御方法であって、各ホストコンピュータからの印刷情報の種類を判定する判定工程と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに前記プリンタ制御装置に転送する転送工程と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程と、を有することを特徴とする印刷制御システム印刷制御システムの印刷制御方法。

【請求項6】 所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムを制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、各ホストコンピュータからの印刷情報の種類を判定する判定工程と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに前記プリンタ制御装置に転送する転送工程と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程とを含む、コンピュータが読み出し可能なプログラムを格納したことを特徴とする記憶媒体。

【請求項7】 所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムの印刷制御方法であって、各ホストコンピュータからの前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定工程と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに、あるいは前記印刷情報を前記プリンタ制御装置に転送する転送工程と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程と、を有することを特徴とする印刷制御システム印刷制御システムの印刷制御方法。

【請求項8】 所定の通信媒体を介して複数のホストコ

ンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムを制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、各ホストコンピュータからの前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定工程と、

該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに、あるいは前記印刷情報を前記プリンタ制御装置に転送する転送工程と、

前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程とを含む、コンピュータが読み出し可能なプログラムを格納したことを特徴とする記憶媒体。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムおよび印刷制御システムの印刷制御方法およびコンピュータが読み出し可能なプログラムを格納した記憶媒体に関するものである。

【0002】

【従来の技術】従来よりコンピュータなどを利用して作成した文書をプリントする、複数の利用者により共有するプリンタとしてネットワークプリンタが一般的になっている。

【0003】これは各利用者が利用する複数のホストコンピュータと、プリントジョブを一時的に保持するプリンタサーバ、1台以上のプリンタをネットワークにより接続し、プリンタサーバ経由でプリントデータをプリンタに送信してプリントするという形態である。

【0004】また、最近では1つのプリンタでAdobe Systems社製の「PostScript」言語と、Hewlett Packard社製の「PCL5e」言語の2つのページ記述言語を処理して画像データを生成可能なプリンタが一般的であり、また、受信したデータの内容からこの2つのページ記述言語のどちらのデータかを判定し処理するプリンタが一般的になっている。

【0005】図7は、この種のプリンタシステムの構成を説明するブロック図である。

【0006】図7において、1-1、1-2はホストコンピュータで、ネットワーク50を介してプリンタサーバ2、プリンタ5とが通信可能に構成されている。

【0007】プリンタサーバ2において、3はネットワ

ークインタフェースで、ネットワーク50との通信を行う。4はハードディスクで、ホストコンピュータ1-1、1-2からの印刷要求をスプールする。

【0008】プリンタ5において、6はネットワークインタフェースで、ネットワーク50との通信を行う。7はROMで、CPU8が実行すべき各種の制御プログラム、データ、フォントデータ等を記憶している。9は画像メモリで、CPU8がネットワークインタフェース6を介して受信した印刷情報に基づいて描画した印刷可能な画像データを所定量記憶する。10は画像形成部（プリンタエンジン）で、画像メモリ9に記憶された画像データに基づいて記録媒体に印刷を行う。

【0009】なお、ROM7上には受信したデータの種類の判定する判定用ファームウェアと、PostScript言語のデータを処理して画像データを生成するファームウェアと、PCL5e言語のデータを処理して画像データを生成するファームウェアとが保存されている。以下、ホストコンピュータ1-1からプリンタ5によりプリントする場合について説明する。

【0010】図8は、図7に示したプリンタサーバ2のデータ処理手順の一例を示すフローチャートである。なお、(1)～(3)は各ステップを示す。また、ホストコンピュータ1-1の利用者がホストコンピュータ1-1においてプリントの指示を行うと、プリンタ5に送信するためのデータを生成するプリンタドライバによりプリント用のデータが生成される。なお、生成されるプリント用データは使用するプリンタドライバにより異なる。本例においてはAdobe Systems社のPostScript言語と、Hewlett Packard社のPCL5eを使用する場合について述べる。

【0011】まず、プリンタドライバにより生成されたデータはネットワーク50を経由してプリンタサーバ2に転送され、プリンタサーバ2ではネットワーク50を介して送られてきた文書データをネットワークインタフェース3経由で受信する(1)。次いで、プリンタサーバ2では受信したデータを一旦ハードディスク4に保存する(2)。

【0012】その後、ハードディスク4に保存されたデータはネットワークインタフェース3、ネットワーク50経由でプリンタ5に送られ(3)、処理を終了する。

【0013】図9は、図7に示したプリンタ5のデータ処理手順の一例を示すフローチャートである。なお、(1)～(7)は各ステップを示す。

【0014】まず、プリンタ5ではプリンタサーバ2から送信されたデータを受信し(1)、受信したデータを解析し(2)、PostScript言語のデータか、PCL5e言語のデータかどうかを判定し(3)、受信したデータがPostScript言語のデータであると判定された場合には、PostScript言語のデータを処理するファームウェアを起動してデータを処理し、画像データを画像メモリ9

上に生成し(4)、ステップ(7)以降に進む。

【0015】一方、ステップ(3)で、NOと判定された場合は、PCL5e言語のデータであるかどうかを判定し(5)、PCL5e言語であると判定された場合には、PCL5e言語のデータを処理するファームウェアを起動してデータを処理し、画像データを画像メモリ9上に生成する(6)。次いで、画像メモリ9上に生成された画像データをもとに画像形成部10により用紙上に画像を形成し(10)、処理を終了する。

【0016】一方、ステップ(5)でPCL5eの言語でないとして判定された場合は、画像データを受信したものと

してステップ(7)で印刷して、処理を終了する。
【0017】このようにして、ホストコンピュータ1-1、1-2により生成されたページ記述言語のデータをプリンタサーバに一時的に保存した後、プリンタ5に転送してページ記述言語処理用ファームウェアにより処理して画像データを生成し、画像を形成することが可能である。

【0018】

【発明が解決しようとする課題】しかしながら、プリンタの動作プログラムはプリンタ内のROM8に記憶されるため、動作プログラムを更新を行うためにはROM8の交換が必要となる。さらに複数のプリンタの動作プログラム

の更新はそれぞれのプリンタのROM交換が必要となる。
【0019】また、複数のページ記述言語をサポートするプリンタの場合には、各ページ記述言語用の動作プログラムをプリンタのROMに記憶する必要があるので大容量のROMが必要となる。

【0020】さらに、複数のページ記述言語をサポートするプリンタの場合には受信した文書データがどのページ記述言語の文書データかをプリンタにおいて判定する必要があるため、プリンタの動作プログラムにページ記述言語判定の機能を含める必要がある。

【0021】また、新しいページ記述言語をサポートする場合にその動作プログラムを記憶するためのROMの空き領域が不足するため大容量のROMを実装可能な回路を再設計する必要がある。

【0022】さらに、複数のプリンタが接続されるシステムの場合、すべてのプリンタにROMが必要となるためシステム全体として多数のROMが必要となるためコストアップになる等の問題点があった。

【0023】本発明は、上記の問題点を解消するためになされたもので、本発明に係る第1の発明～第8の発明の目的は、種々の印刷情報を解析するための解析資源を印刷情報とともにサーバ装置から取得して組み替え可能とすることにより、種々の印刷情報を解析するための解析資源の変更や、解析資源の種類が増えても印刷制御装置側に確保すべきメモリ負担を最小限とすることができる印刷制御システムおよび印刷制御システムの印刷制御

方法およびコンピュータが読み出し可能なプログラムを格納した記憶媒体を提供することである。

【0024】

【課題を解決するための手段】本発明に係る第1の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムであって、各ホストコンピュータからの印刷情報を保存する保存手段と、前記印刷情報を解析処理するための種別の異なる解析資源を記憶する記憶手段と、前記保存手段に保存された前記印刷情報の種類を判定する判定手段と、前記判定手段の判定結果に基づいて前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに前記プリンタ制御装置に転送する転送手段とを有するサーバ装置と、前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理手段を有する印刷制御装置とを備えるものである。

【0025】本発明に係る第2の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムであって、各ホストコンピュータからの印刷情報を保存する保存手段と、前記印刷情報を解析処理するための種別の異なる解析資源を記憶する記憶手段と、前記保存手段に保存された前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定手段と、前記判定手段の照合判定結果に基づいて前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに、あるいは前記保存手段に保存された前記印刷情報を前記プリンタ制御装置に転送する転送手段とを有するサーバ装置と、前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理手段を有する印刷制御装置とを備えるものである。

【0026】本発明に係る第3の発明は、前記判定手段は、前記印刷情報のページ記述言語の種類を判定するものである。

【0027】本発明に係る第4の発明は、前記判定手段は、前記印刷情報のデータ圧縮方式の種類を判定するものである。

【0028】本発明に係る第5の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される

前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムの印刷制御方法であって、各ホストコンピュータからの印刷情報の種類を判定する判定工程と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに前記プリンタ制御装置に転送する転送工程と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程とを有するものである。

【0029】本発明に係る第6の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムを制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、各ホストコンピュータからの印刷情報の種類を判定する判定工程と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに前記プリンタ制御装置に転送する転送工程と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程とを含む、コンピュータが読み出し可能なプログラムを記憶媒体に格納したものである。

【0030】本発明に係る第7の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムの印刷制御方法であって、各ホストコンピュータからの前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定工程と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに、あるいは前記印刷情報を前記プリンタ制御装置に転送する転送工程と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程とを有するものである。

【0031】本発明に係る第8の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムを制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、各ホストコンピュータからの前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定工程と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに、あるいは前記印

刷情報を前記プリンタ制御装置に転送する転送工程と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程とを含む、コンピュータが読み出し可能なプログラムを記憶媒体に格納したものである。

【0032】

【発明の実施の形態】

【第1実施形態】図1は、本発明の第1実施形態を示す印刷システムの構成を説明するブロック図であり、図7と同一のものには同一の符号を付してある。

【0033】図1において、1-1、1-2はプリントする文書を作成し、プリント用のデータを生成するホストコンピュータ、2はプリンタサーバで、ホストコンピュータ1-1、1-2から送信されたデータおよびプリンタの動作用ファームウェアを保持し、プリンタ5に送信する。3はネットワークインタフェースで、ネットワーク50を介してのデータおよびファームウェアの転送を制御する。4はハードディスクで、データやファームウェアを保持する。5はプリンタで、ファームウェアによりデータを整理して画像を生成し、用紙上に画像形成を行う。

【0034】6はネットワークインタフェースで、ネットワーク50を介してのデータおよびファームウェアの転送を制御するプログラムを保持する。

【0035】8はCPUで、ROM7に記憶された制御プログラムに基づいてプリンタ5のファームウェアを実行する。9は画像メモリで、画像データを保持する。10は画像形成部で、画像メモリ9上に形成された画像データをもとに用紙上に画像を形成する。50はEthernetなどのコンピュータやプリンタを結合するためのネットワークである。51はハードディスクインタフェース、52はCPUバスである。

【0036】なお、ハードディスク4にプリンタ5においてデータを処理して画像データを生成するためのプリンタ用のPostScriptファームウェア（第1のファームウェア）11およびPCL5e用ファームウェア（第1のファームウェア）12が保存されているものとする。

【0037】以下、本実施形態と第1～第4の発明の各手段との対応及びその作用について図1等を参照して説明する。

【0038】第1の発明は、所定の通信媒体（ネットワーク50）を介して複数のホストコンピュータ1-1、1-2からの印刷情報を管理するサーバ装置（プリンタサーバ2）と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムであって、各ホストコンピュータからの印刷情報を保存する保存手段（ハードディスク4）と、前記印刷情報を解析処理する

ための種別の異なる解析資源を記憶する記憶手段（ハードディスク4）と、前記保存手段に保存された前記印刷情報の種類を判定する判定手段（プリンタサーバ2の図示しないCPU）と、前記判定手段の判定結果に基づいて前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに前記プリンタ制御装置に転送する転送手段（プリンタサーバ2の図示しないCPU）とを有するサーバ装置と、前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理手段（CPU8がROM7に記憶された制御プログラムを実行して処理する）を有する印刷制御装置とを備え、サーバ装置側のCPUがハードディスク4に保存された前記印刷情報の種類を判定し、該判定結果に基づいて転送手段が前記印刷情報を解析するための最適なファームウェア11、12をハードディスク4から選択して保存された印刷情報とともに前記プリンタ制御装置に転送し、前記プリンタ制御装置側のプリンタサーバ2から前記印刷情報とともに転送されるファームウェアに基づいてCPU8が前記印刷情報を解析して前記画像形成部10から出力可能な画像データを生成するので、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成することができる。

【0039】第2の発明は、所定の通信媒体（ネットワーク50）を介して複数のホストコンピュータ1-1、1-2からの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部10からの出力を制御する印刷制御装置とが通信可能な印刷制御システムであって、各ホストコンピュータからの印刷情報を保存する保存手段（ハードディスク4）と、前記印刷情報を解析処理するための種別の異なる解析資源を記憶する記憶手段（ハードディスク4）と、前記保存手段に保存された前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定手段（プリンタサーバ2の図示しないCPU）と、前記判定手段の照合判定結果に基づいて前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに、あるいは前記保存手段に保存された前記印刷情報を前記プリンタ制御装置に転送する転送手段（プリンタサーバ2の図示しないCPU）とを有するサーバ装置と、前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理手段（CPU8がROM7に記憶された制御プログラ

ムを実行して処理する）を有する印刷制御装置とを備え、プリンタサーバ2の図示しないCPUがハードディスク4に保存された前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定し、該判定結果に基づいて印刷情報を解析するための最適な解析資源をハードディスク4から選択して保存された前記印刷情報とともに、あるいはハードディスク4に保存された前記印刷情報を前記プリンタ制御装置に転送し、前記プリンタ制御装置側の前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいてCPU8が前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成するので、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成することができるとともに、サーバ装置から転送する印刷情報を解析する解析資源が印刷制御装置側に既に記憶されている場合には、同一の解析資源を再送することなく印刷情報のみを転送するので、該印刷情報の出力結果を得るまでの処理時間を大幅に短縮することができる。

【0040】第3の発明は、前記判定手段は、前記印刷情報のページ記述言語の種類を捉えて判定するので、種々のページ記述言語に基づく印刷情報を解析すべき最適な解析資源を特定することができる。

【0041】第4の発明は、前記判定手段は、前記印刷情報のデータ圧縮方式の種類を判定するので、種々のデータ圧縮方式に基づく印刷情報を解析すべき最適な解析資源を特定することができる。

【0042】図2は、本発明に係る印刷システムの第1のデータ処理手順の一例を示すフローチャートであり、図1に示したプリンタサーバ2の処理に対応する。なお、(1)～(7)は各ステップを示す。

【0043】なお、ホストコンピュータ1-1の利用者がホストコンピュータ1-1においてプリントの指示を行うと、プリンタに送信するためのデータを生成するプリンタドライバによりプリント用のデータが生成される。生成されるプリント用データは使用するプリンタドライバにより異なる。本実施形態においてはAdobe Systems社のPostscript言語と、Hewlett Packard社のPCL5e言語を使用する場合において述べるが、他の言語であってもよい。また、プリンタドライバにより生成されたデータはネットワーク50を経由してプリンタサーバ2に転送される。

【0044】先ず、ホストコンピュータ1-1から転送されたデータはネットワーク50、ネットワークインタフェース3を介して受信され(1)、ハードディスク4に保存される(2)。

【0045】次に、プリンタサーバ2ではハードディス

ク4に保存したデータを解析してそのデータを判定し(3)、PostScriptのデータであるかどうかを判定し(4)、PostScriptのデータであると判定した場合には、ハードディスク4に保存されているPostScriptデータの展開用ファームウェア11を読み出して、ハードディスク4に保存されたデータとともにネットワークインタフェース3、ネットワーク50を介してプリンタ5に送信して(5)、処理を終了する。

【0046】一方、ステップ(4)で、PostScriptのデータでないと判定された場合は、プリンタサーバ2ではハードディスク4に保存したデータを解析してそのデータがPCL5eのデータであるかどうかを判定し

(6)、PCL5eのデータでないと判定された場合には、処理を終了し、PCL5eのデータであると判定された場合には、PCL5eデータの展開用ファームウェア12を読み出して、ハードディスク4に保存されたデータとともにネットワークインタフェース3、ネットワーク50を介してプリンタ5に送信して(7)、処理を終了する。

【0047】図3は、本発明に係る印刷システムの第1のデータ処理手順の一例を示すフローチャートであり、図1に示したプリンタ5の処理に対応する。なお、

(1)～(3)は各ステップを示す。また、プリンタ5ではプリントやデータ処理を行っていない状態ではROM7に保持された動作プログラムにより動作し、このプログラムはネットワーク経由で送信されてくるファームウェア及びデータの受信、ファームウェアの実行開始を行うものである。

【0048】まず、プリンタサーバ2からネットワーク50を介して送信されたファームウェア及びデータをネットワークインタフェース6を介して受信したら

(1)、該受信したファームウェアはプリンタ5の記憶領域(図示せず)に保存され、ファームウェアの保存完了後、保存されたファームウェアの実行を開始する。

【0049】そして、ファームウェアが実行されるとネットワークインタフェース6を介して受信されたデータを受け取り、受け取ったデータを処理して画像メモリ9上に画像データを生成する(2)。そして、すべてのデータを受け取り、画像データの生成が完了した後、ファームウェアは画像形成部10に対してプリントの開始を命令する。これにより、画像形成部10では予め用紙カセットに積載された用紙を給紙し、画像メモリ9に保持されている画像データをもとに用紙上に画像を形成し、排紙するプリントを実行し(3)、処理を終了する。以上の動作によりホストコンピュータ1-1により生成されたページ記述言語のデータをもとにした画像形成が完了する。

【0050】本実施形態によれば、プリンタ5のROM7に予め保持しておくプログラムはファームウェア及びデータの受信を制御するファームウェアのみとなるた

め、少ない記憶容量のROMを使用することが可能となる。

【0051】また、ページ記述言語処理用のファームウェアをすべてプリンタサーバ2に保持しておくためページ記述言語処理用のファームウェアの更新や変更、追加が容易である。

【0052】以下、本実施形態と第5、第6の発明の各工程との対応及びその作用について図2、図3等を参照して説明する。

【0053】第5の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムの印刷制御方法であって、各ホストコンピュータからの印刷情報の種類を判定する判定工程(図2のステップ(4)、(5))と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに前記プリンタ制御装置に転送する転送工程(図2のステップ

(5)、(7))と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程(図3のステップ(1)～(3))とをプリンタサーバ2の図示しないCPUおよびプリンタ5のCPU8が読み出して実行して、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成することができる。

【0054】第6の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムを制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、各ホストコンピュータからの印刷情報の種類を判定する判定工程(図2のステップ(4)、(5))と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに前記プリンタ制御装置に転送する転送工程(図2のステップ

(5)、(7))と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程(図3のステップ(1)～(3))とを含む、コンピュータが読み出し可能なプログラムを記憶媒体に格納したものである。すなわち、後述する外部記憶媒体または内部の記憶資源に図2、図3に示す工程に対応するプログラムコードを記憶させ、該プログラムコードを記憶した記憶媒体からプリンタサーバ2の図示しないCPUおよ

びプリンタ5のCPU8が読み出して実行する形態も本発明の実施形態に含まれるものである。

【0055】〔第2実施形態〕本実施形態はシステム構成及びハードウェアは第1実施形態と同一であり、プリンタサーバ2およびプリンタ5内部の動作のみが異なるため、システムの構成は図1と同様であるので説明は省略する。

【0056】図4は、本発明に係る印刷システムの第2のデータ処理手順の一例を示すフローチャートであり、図1に示したプリンタサーバ2の処理に対応する。なお、(1)～(10)は各ステップを示す。

【0057】まず、ホストコンピュータ1-1から転送されたデータはネットワーク50、ネットワークインタフェース3を介して受信され(1)、ハードディスク4に保存される(2)。そして、プリンタサーバ5ではハードディスク4に保存したデータを解析してそのデータがPostScriptのデータか、PCL5eのデータかを判定する(3)。

【0058】次に、プリンタ5に対してプリンタ5の記憶領域に現在保持されているファームウェアの種類を問い合わせ(4)、ステップ(3)における判定結果とステップ(4)における問い合わせ結果(プリンタ5から返信される)を比較し、一致しているかどうかを判定し(5)、一致していると判定したならステップ(10)に進み、一致しない場合には、ステップ(3)の判定結果に基づいて、判定結果がPostScriptのデータであるかどうかを判定し(6)、YESの場合にはハードディスク4に保存されているPostScriptデータの展開用ファームウェア11を読み出して、ネットワークインタフェース3、ネットワーク50を介してプリンタ5に送信し(7)、ステップ(10)以降へ進む。

【0059】一方、ステップ(6)で、判定結果がPostScriptのデータでないと判定された場合には、ステップ(3)の判定結果に基づいて、判定結果がPCL5eのデータであるかどうかを判定して(8)、ハードディスク4に保存されているPCL5eデータの展開用ファームウェア12を読み出して、ネットワークインタフェース3、ネットワーク50を介してプリンタ5に送信して(9)、ステップ(10)以降へ進む。

【0060】次に、ハードディスク4に保存されたデータを読み出して、ネットワークインタフェース3、ネットワーク50を介してプリンタ5に送信して(10)、処理を終了する。

【0061】一方、ステップ(8)で、NOと判定された場合は、保存されたデータをプリンタ5に送信して(10)、処理を終了する。

【0062】図5は、本発明に係る印刷システムの第2のデータ処理手順の一例を示すフローチャートであり、図1に示したプリンタ5の処理に対応する。なお、

(1)～(6)は各ステップを示す。また、プリンタ5

ではプリントやデータ処理を行っていない状態ではROM7に保持された動作プログラムにより動作し、このプログラムはプリンタサーバ5からの現在記憶領域に保持されているファームウェアの問い合わせに対しての返事、ネットワーク経由で送信されてくるファームウェア及びデータの受信、ファームウェアの実行開始を行うものである。

【0063】このROM上のプログラムはファームウェア実行中以外は常時動作しており、ネットワークインタフェース6経由で何らかの通信制御が必要な場合以外は特定の処理を行わないものとする。

【0064】まず、ネットワークインタフェース6経由でプリンタサーバ2からプリンタ5上に保持されているファームウェアの問い合わせがあったかどうかを判定して(1)、問い合わせがあったと判定した場合は、プリンタ5上に保持されているファームウェアの情報をプリンタサーバ2に対して通知する(2)。

【0065】一方、ステップ(1)で、ファームウェアの問い合わせがなかったと判定した場合には、ネットワークインタフェース6経由での通信がファームウェアの受信であるかどうかを判定し(3)、ファームウェアの受信であると判定した場合にはプリンタサーバ2からネットワーク50を介して送信されたファームウェアをネットワークインタフェース6を介して受信し、該受信したファームウェアはプリンタ5のファームウェアを保持する記憶領域(図示せず)に保存して(4)、ステップ(1)へ戻る。

【0066】一方、ネットワークインタフェース6経由での通信がデータの受信であったと判定した場合には、プリンタサーバ2からネットワーク50を介して送信されたデータを受信し、ファームウェアを保持する領域に保持されたファームウェアを起動してファームウェアにより受信したデータを処理し、画像メモリ9上に画像を生成し、すべてのデータを受け取り、画像データの生成が完了した後、ファームウェアは画像形成部10に対してプリントの開始を命令する。そして、画像形成部10では予め用紙カセットに積載された用紙を給紙し、画像メモリ9に保持されている画像データをもとに用紙上に画像を形成し、排紙するプリントを実行して(6)、ステップ(1)へ戻る。

【0067】以上の動作によりホストコンピュータ1-1により生成されたページ記述言語のデータをもとに画像形成が完了する。本実施形態では、直前に送信したファームウェアがプリンタ5にあり、そのファームウェアにより今回処理しようとするデータが処理可能であれば新たにファームウェアを転送せずにデータの理解を行うことができる。

【0068】また、次のデータ処理に直前のデータ処理に利用したファームウェアを使用する可能性があるため、ファームウェアを保持する記憶領域(図示せず)に

保存されたファームウェアは別のファームウェアを受信するまでは保持し続ける。

【0069】本実施形態によれば、直前の画像形成に利用したファームウェアにより処理可能なデータであれば、新たにファームウェアを転送せずにデータの処理を行うことが可能である。よって、ファームウェアをダウンロードする時間が不要になる場合があるためデータ生成完了までに要する時間を短縮することができる。

【0070】また、ファームウェアを転送する頻度が減少するためネットワーク上を流れるデータ量が減少するというメリットがある。

【0071】以下、本実施形態と第7、第8の発明の各工程との対応及びその作用について図4、図5等を参照して説明する。

【0072】第7の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムの印刷制御方法であって、各ホストコンピュータからの前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定工程（図4のステップ（3）～（6）、（8）、図5のステップ（1）、（2））と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに、あるいは前記印刷情報を前記プリンタ制御装置に転送する転送工程（図4のステップ（7）、（9））と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程（図5のステップ（3）、（5）、（6））とをプリンタサーバ2の図示しないCPUおよびプリンタ5のCPU8が読み出して実行して、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成できるとともに、サーバ装置から転送する印刷情報を解析する解析資源が印刷制御装置側に既に記憶されている場合には、同一の解析資源を再送することなく印刷情報のみを転送するので、該印刷情報の出力結果を得るまでの処理時間を大幅に短縮することができる。

【0073】第8の発明は、所定の通信媒体を介して複数のホストコンピュータからの印刷情報を管理するサーバ装置と、前記サーバ装置から転送される前記印刷情報を解析して画像形成部からの出力を制御する印刷制御装置とが通信可能な印刷制御システムを制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、各ホストコンピュータからの前記印刷情報の種

類および前記印刷制御装置から取得される解析資源の種類とを照合判定する判定工程（図4のステップ（3）～（6）、（8）、図5のステップ（1）、（2））と、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに、あるいは前記印刷情報を前記プリンタ制御装置に転送する転送工程（図4のステップ（7）、（9））と、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成する画像処理工程（図5のステップ（3）、

（5）、（6））とを含む、コンピュータが読み出し可能なプログラムを記憶媒体に格納したものである。すなわち、後述する外部記憶媒体または内部の記憶資源に図2、図3、図4、図5に示す工程に対応するプログラムコードを記憶させ、該プログラムコードを記憶した記憶媒体からプリンタサーバ2の図示しないCPUおよびプリンタ5のCPU8が読み出して実行する形態も本発明の実施形態に含まれるものである。

【0074】以下、図6に示すメモリマップを参照して本発明に係る印刷システムで読み出し可能なデータ処理プログラムの構成について説明する。

【0075】図6は、本発明に係る印刷システムで読み出し可能な各種データ処理プログラムを格納する記憶媒体のメモリマップを説明する図である。

【0076】なお、特に図示しないが、記憶媒体に記憶されるプログラム群を管理する情報、例えばバージョン情報、作成者等も記憶され、かつ、プログラム読み出し側のOS等に依存する情報、例えばプログラムを識別表示するアイコン等も記憶される場合もある。

【0077】さらに、各種プログラムに従属するデータも上記ディレクトリに管理されている。また、各種プログラムをコンピュータにインストールするためのプログラムや、インストールするプログラムが圧縮されている場合に、解凍するプログラム等も記憶される場合もある。

【0078】本実施形態における図2、図3、図4、図5に示す機能が外部からインストールされるプログラムによって、ホストコンピュータにより遂行されていてもよい。そして、その場合、CD-ROMやフラッシュメモリやFD等の記憶媒体により、あるいはネットワークを介して外部の記憶媒体から、プログラムを含む情報群を出力装置に供給される場合でも本発明は適用されるものである。

【0079】以上のように、前述した実施形態の機能を実現するソフトウェアのプログラムコードを記録した記憶媒体を、システムあるいは装置に供給し、そのシステムあるいは装置のコンピュータ（またはCPUやMPU）が記憶媒体に格納されたプログラムコードを読み出し実行することによっても、本発明の目的が達成されることは言うまでもない。

【0080】この場合、記憶媒体から読み出されたプログラムコード自体が本発明の新規な機能を実現することになり、そのプログラムコードを記憶した記憶媒体は本発明を構成することになる。

【0081】プログラムコードを供給するための記憶媒体としては、例えば、フロッピーディスク、ハードディスク、光ディスク、光磁気ディスク、CD-ROM、CD-R、磁気テープ、不揮発性のメモ리카ード、ROM、EEPROM等を用いることができる。

【0082】また、コンピュータが読み出したプログラムコードを実行することにより、前述した実施形態の機能が実現されるだけでなく、そのプログラムコードの指示に基づき、コンピュータ上で稼働しているOS（オペレーティングシステム）等が実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【0083】さらに、記憶媒体から読み出されたプログラムコードが、コンピュータに挿入された機能拡張ボードやコンピュータに接続された機能拡張ユニットに備わるメモリに書き込まれた後、そのプログラムコードの指示に基づき、その機能拡張ボードや機能拡張ユニットに備わるCPU等が実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【0084】また、上記実施形態では、画像形成方式を特定していないが、本発明はレーザビーム方式、LED方式、インクジェット方式等の様々な画像形成方式のプリンタエンジンを制御するプリンタ制御装置に適用することができる。

【0085】さらに、上記実施形態では、画像データの出力先を画像形成部とする場合について説明したが、出力先はプリンタに限定されるものではなく、CRT等の画像表示装置等にも適用することができる。

【0086】また、プリンタ側で処理モジュール（解析資源）を一時的に記憶する領域についても、DRAM、FlashROM、ハードディスク等で構成することも可能である。

【0087】さらに、上記実施形態では、解析資源がプリンタ用のPostScriptおよびPCL5eである場合について説明したが、キャノン社製のLIPS言語、マイクロソフト社製のWindows GDIコマンド等様々な画像描画用の言語に対応可能であるとともに、画像をプリントする場合には画像の圧縮方式であるJPEG、GIF、TIFF等の画像データを受信して画像を形成する各処理モジュール（解析資源）を用意して本発明を適用することにより、ページ記述言語に限らず様々なフォーマットの画像データをもとに画像を生成することも可能となる。

【0088】

【発明の効果】以上説明したように、本発明に係る第1

の発明によれば、サーバ装置側の判定手段が保存手段に保存された前記印刷情報の種類を判定し、該判定結果に基づいて転送手段が前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに前記プリンタ制御装置に転送し、前記プリンタ制御装置側の前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて画像処理手段が前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成するので、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成することができる。

【0089】第2の発明によれば、サーバ装置側の判定手段が保存手段に保存された前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定し、該判定結果に基づいて転送手段が前記印刷情報を解析するための最適な解析資源を前記記憶手段から選択して前記保存手段に保存された前記印刷情報とともに、あるいは前記保存手段に保存された前記印刷情報を前記プリンタ制御装置に転送し、前記プリンタ制御装置側の前記サーバ装置から前記印刷情報とともに転送される解析資源に基づいて画像処理手段が前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成するので、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成することができるとともに、サーバ装置から転送する印刷情報を解析する解析資源が印刷制御装置側に既に記憶されている場合には、同一の解析資源を再送することなく印刷情報のみを転送するので、該印刷情報の出力結果を得るまでの処理時間を大幅に短縮することができる。

【0090】第3の発明によれば、前記判定手段は、前記印刷情報のページ記述言語の種類を捉えて判定するので、種々のページ記述言語に基づく印刷情報を解析すべき最適な解析資源を特定することができる。

【0091】第4の発明によれば、前記判定手段は、前記印刷情報のデータ圧縮方式の種類を判定するので、種々のデータ圧縮方式に基づく印刷情報を解析すべき最適な解析資源を特定することができる。

【0092】第5、第6の発明によれば、各ホストコンピュータからの印刷情報の種類を判定し、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに前記プリンタ制御装置に転送し、前記印刷情報とともに転送される解析資源に

基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成するので、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成することができる。

【0093】第7、第8の発明によれば、各ホストコンピュータからの前記印刷情報の種類および前記印刷制御装置から取得される解析資源の種類とを照合判定し、該判定結果に基づいて前記印刷情報を解析するための最適な解析資源を選択して前記印刷情報とともに、あるいは前記印刷情報を前記プリンタ制御装置に転送し、前記印刷情報とともに転送される解析資源に基づいて前記印刷情報を解析して前記画像形成部から出力可能な画像データを生成するので、サーバ装置から転送される印刷情報を解析処理する異なる種類の解析資源が増えたり、同種類の解析資源の内容がバージョンアップされても、印刷制御装置側に確保すべき解析資源記憶容量を増量することなく、常に最適な解析資源に基づいて印刷情報から画像データを安価に生成できるとともに、サーバ装置から転送する印刷情報を解析する解析資源が印刷制御装置側に既に記憶されている場合には、同一の解析資源を再送することなく印刷情報のみを転送するので、該印刷情報の出力結果を得るまでの処理時間を大幅に短縮することができる。

【0094】従って、種々の印刷情報を解析するための解析資源の変更や、解析資源の種類が増えても印刷制御装置側に確保すべきメモリ負担を最小限とすることができる等の効果を奏する。

【図面の簡単な説明】

【図1】本発明の第1実施形態を示す印刷システムの構

成を説明するブロック図である。

【図2】本発明に係る印刷システムの第1のデータ処理手順の一例を示すフローチャートである。

【図3】本発明に係る印刷システムの第1のデータ処理手順の一例を示すフローチャートである。

【図4】本発明に係る印刷システムの第2のデータ処理手順の一例を示すフローチャートである。

【図5】本発明に係る印刷システムの第2のデータ処理手順の一例を示すフローチャートである。

【図6】本発明に係る印刷システムで読み出し可能な各種データ処理プログラムを格納する記憶媒体のメモリマップを説明する図である。

【図7】の種のプリンタシステムの構成を説明するブロック図である。

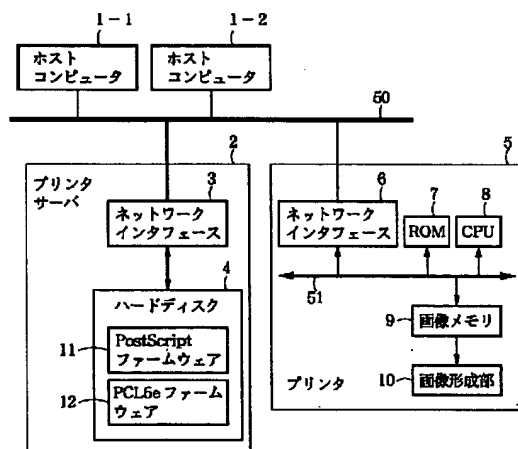
【図8】図7に示したプリンタサーバのデータ処理手順の一例を示すフローチャートである。

【図9】図7に示したプリンタのデータ処理手順の一例を示すフローチャートである。

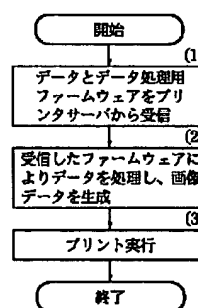
【符号の説明】

- 1-1 ホストコンピュータ
- 1-1 ホストコンピュータ
- 2 プリンタサーバ
- 3 ネットワークインタフェース
- 4 ハードディスク
- 5 プリンタ
- 6 ネットワークインタフェース
- 7 ROM
- 8 CPU
- 9 画像メモリ
- 10 画像形成部
- 11 第1のファームウェア
- 12 第2のファームウェア

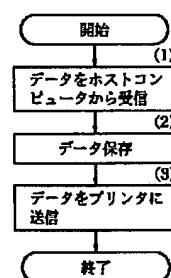
【図1】



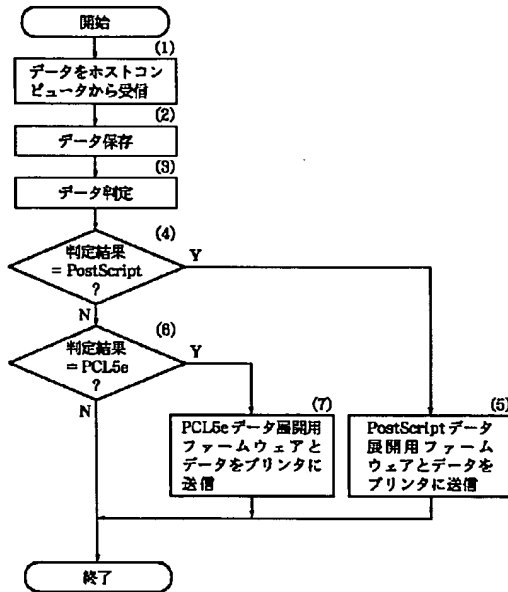
【図3】



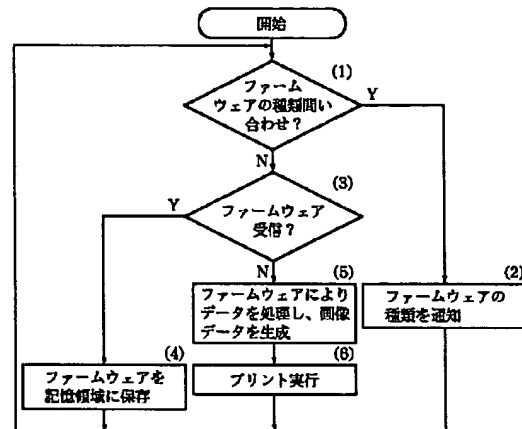
【図8】



【図2】



【図5】



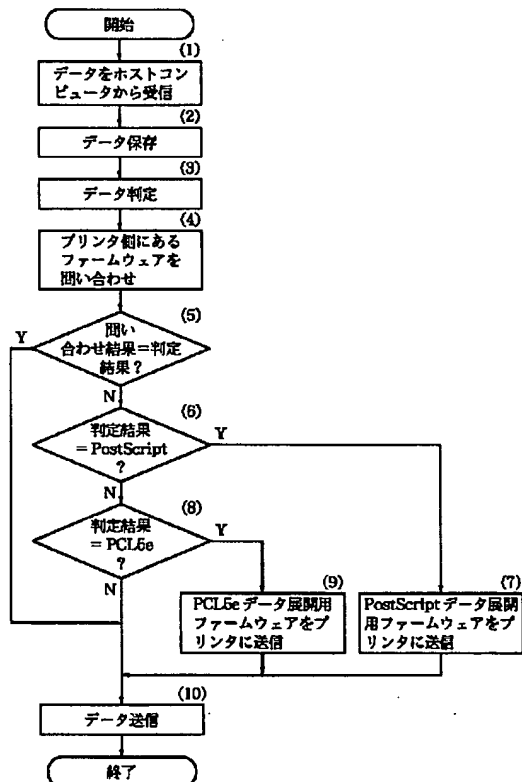
【図6】

FD/CD-ROM等の記憶媒体

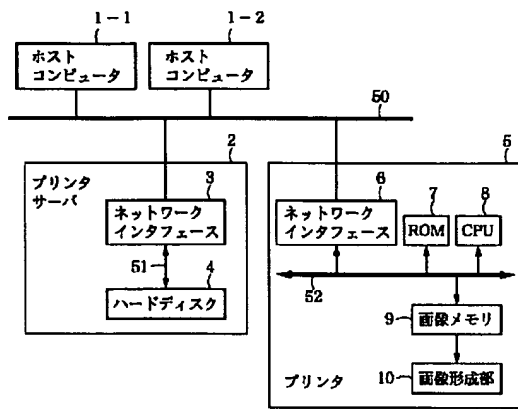
ディレクトリ情報
第1のデータ処理プログラム 図2に示すフローチャートのステップに対応するプログラムコード群
第2のデータ処理プログラム 図3に示すフローチャートのステップに対応するプログラムコード群
第3のデータ処理プログラム 図4に示すフローチャートのステップに対応するプログラムコード群
第4のデータ処理プログラム 図5に示すフローチャートのステップに対応するプログラムコード群

記憶媒体のメモリマップ

【図4】



【図7】



【図9】

